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Increasing eye contact and appropriate verbalizations of young children with autistic characteristics

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**INCREASING EYE CONTACT AND
APPROPRIATE VERBALIZATIONS OF YOUNG CHILDREN
WITH AUTISTIC CHARACTERISTICS**

by

Ping Ping Seah

A thesis submitted in partial fulfilment of the requirements for the award of
Master of Education (Children with Special Needs)
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USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

Social skills have been widely regarded by researchers and educators to be crucial to successful school performances as well as an individual's overall social functioning. The need to be competent in social skills increases for children with autism or autistic characteristics.

A teaching strategy was modelled and taught to increase appropriate verbal and non-verbal responses of the participants through sociodramatic play with the researcher and trained peers. Hats and toys belonging to various occupations were used as training material. The two dependent variables measured were the number of appropriate verbalizations and total length of eye contact time given by each participant within each 2-minute session of role-play activities.

The individual studies in this research were based on a single-subject A-B-C-D-E-A experimental research design with a follow-up period. A was the baseline, and B, C, D and E were the intervention conditions. The participants were three boys aged between 5 to 7 years old who met the DSM-IV diagnostic criteria for autism. Their IQ scores ranged from 110 to 117 and are considered by child psychologists and therapists to be high-functioning autistic children with deficits in social communication and interaction skills.

Results indicate marked increases in verbalizations and moderate gains in eye contact. The children's length of verbalizations (number of words spoken), vocabulary (new words spoken), use of own language, spontaneity of language, ability to pay attention and interest in imaginative play were also observed to have improved as a result of the

teaching interventions. Maintenance was evident in the follow-up sessions. The learning behaviour of each participant during the interventions and recommendations for future interventions and research were discussed.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

- (i) incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;
- (ii) contain any material previously published or written by another person except where due reference is made in the text; or
- (iii) contain any defamatory material.

Signature _____

Date 1st December 1997

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CHAPTER 1

INTRODUCTION

Kanner (1943) first noted and described *autism* as a psychological disorder. According to his descriptions, children with childhood autism tend to be aloof and indifferent to people and show "an inability to relate in an ordinary way to people and to situations" (p. 217). Most authorities agree on three features that are essential to the diagnosis of autism: general and profound failure to develop social interaction and relationships, language delay and retardation, and restricted repetitive repertoire of activities (Hoare, 1993; Koegel & Koegel, 1995). Their impaired social relationships include social deficits like a failure to use eye-to-eye gaze for social interaction, difficulties in initiating interaction with others, lack of empathy, and little interest in co-operative and reciprocal play. Their language abnormalities include delayed and deviant language acquisition, poor comprehension, echolalia (repetition of spoken words or phrases) and pronomial reversal like the use of 'you' when 'I' was meant (Kanner, 1943). Repertoires of activities include rigid and restricted patterns of play, unusual preoccupations and interests, and a marked resistance to any change in the environment or daily routine (Hoare, 1993).

Asperger's syndrome is a term used by Wing (1981) for those very able or high-functioning autistic people who do not fit the Kanner stereotype of being silent and aloof. The six diagnostic criteria based on Asperger's (1944) observations are: (a) speech- no delay but content is odd, pedantic and stereotyped, (b) non-verbal communication – little facial expression, monotone voice, and inappropriate gesture, (c) social interactions – not reciprocal and lacking empathy, (d) resistance to change- enjoy repetitive activities,

(e) motor coordination – gait and posture odd, gross movements clumsy, sometimes stereotypes, (f) skills and interests – good rote memory and circumscribed special interests. Wing also claims that children with Asperger's syndrome are not creative. For example, they do not show true pretend play or "original" thoughts and they lack imagination.

Despite these conceptual insights, most professionals use the DSM IV classification (American Psychiatric Association, 1994) to diagnose childhood autism. It is based on three fundamental impairments: qualitative impairment in social interactions, in verbal and nonverbal communication and imaginative activity, and markedly restricted repertoire of activities and interests. The condition has been categorized as a type of pervasive developmental disorder.

A. A total of six (or more) items from (1), and one each from (2) and (3):

(1) qualitative impairment in social interaction, as manifested by at least two of the following:

- (a) marked impairment in the use of multiple nonverbal behaviours such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
- (b) failure to develop peer relationships appropriate to developmental level
- (c) a lack of spontaneous seeking to share enjoyment, interests, or achievements with people (e.g., by a lack of showing, bringing, or pointing out objects of interest)
- (d) lack of social or emotional reciprocity

(2) qualitative impairments in communication as manifested by at least one of the following:

- (a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
- (b) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
- (c) stereotyped and repetitive use of language or idiosyncratic language
- (d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

(3) restricted repetitive and stereotyped patterns of behaviour, interests, and activities, as manifested by at least one of the following:

- (a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
- (b) apparently inflexible adherence to specific, nonfunctional routines or rituals
- (c) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)
- (d) persistent preoccupation with parts of objects

B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, or (3) symbolic or imaginative play (American Psychiatric Association, 1994).

Over the years, researchers (Dunlap, Robbins, Dollman, & Plenis, 1988; Schreibman, 1988) have found that although children who have been diagnosed as having autism or "autistic-like" features share the same diagnosis, their behavioural symptoms vary greatly. In fact, variability may best describe the characteristics of individuals with autism. Whereas all of the children seem to have some difficulties with social communication, the expression of these difficulties differs immensely in both type and severity (Koegel & Koegel, 1995). So, while some children with autism avoid social contact, like Kanner's cases, others are merely passive, or even actively sociable in a peculiar fashion (Wing & Gould, 1979). Since the characteristics of autism vary greatly across children, a child does not have to display all of them in order to be diagnosed with autism. Wing introduced the concept of a *spectrum* of disorders in autism to capture the idea of a range of manifestations of the same handicap.

Children with autism typically have significant difficulty with many pragmatic or social aspects of language (Baltaxe & Simmons, 1975; Eales, 1993; R. L. Koegel & Frea, 1993). Abnormal eye contact is probably the most common pragmatic difficulty commented on in the literature (Rimland, 1964; Rutter, 1978; Dawson & Adams, 1984). This difficulty has many implications for social learning and the use of functional language. Many subtle social cues are learned through observation. If the child is not attending to the eyes or facial cues of someone attempting social interaction, he will have difficulty responding to social initiation and learning to reciprocate or respond in social situations in general. Taking the initiative to verbalize, to interact and to understand human needs and emotions are also not instinctive in a child with autistic characteristics. Halle (1982) has noted that

some autistic children, due to language delay may become dependent on others for initiating communication. Such dependence may reduce motivation for social interaction and lead to learned helplessness (Koegel & Mentis, 1985). Therefore, it is important to teach and practise the two vital skills of making eye contact and capacity for meaningful verbalizations with autistic children. This will enable them to learn to function independently and successfully in different social contexts in life.

Teaching autistic children to make eye contact enables them to pay attention to particular requests or to the persons and environment around them, and be able to respond appropriately in a social context. According to Kozloff (1974) eye contact can be given in two ways: spontaneously and on request. *Spontaneous eye contact* is defined as looking at a person's eyes without prompting from others. This is an important behavior. In everyday life, we use eye contact as a signal. For instance, we use eye contact to prompt people to talk to us or come over to us. Similarly, if we want the children to learn that when others make eye contact with them, it is their signal to do something, for example, following a direction. So our goal is to teach children to make eye contact on their own more often and to hold his gaze for a longer time.

Eye contact on request is defined as looking at a person's eyes when requested to do so. For example, the child makes eye contact within a few seconds after you say something like, "Billy, look at me," or "Look at me." By requesting eye contact from the child, an adult can gradually shape this behavior and increase the child's ability to look and pay attention. Extensive research examining increased eye contact used to improve children's social and learning skills indicates the importance of this basic interaction skill (Kozloff,

1974; Akerman & Benkle, 1982; Berler, Gross, & Drabman, 1982; Hamlet, Axelrod, & Kuerschner, 1984; Tiegerman & Primavera, 1984; Koegel & Frea, 1993).

Closely related to eye contact and social interaction skills are the *verbalization* skills, which refer to the ability to communicate wants, thoughts, ideas, and feelings during social interaction through the use of spontaneous language and language that has been acquired by the child (Charlop & Trasowech, 1991; Matson, Sevin, Box & Francis, 1993). In the research literature, *spontaneous language use* has received various definitions. Koegel, O'Dell and Koegel's (1987) research definition of spontaneity in terms of two factors has been adopted. First, the closeness of the child's communicative responses to the clinician's or researcher's meaning or intent, and second, the child's initiated approximations of words that are not the object of modelling. It is important for autistic children to know how to initiate conversation and activities by asking questions appropriately as well as to answer verbal initiations from others. They need to enhance their conversational and language skills during social interaction and persevere on a topic or theme-related activity for a set time period. The skill of language use is especially critical for accessing the community and social environment. Children who exhibit language delays are often socially disadvantaged. Therefore the intervention research on the spontaneity of language use has emerged as an important issue (Koegel, Koegel & Smith, 1995).

The various techniques used in this research to increase eye contact and verbalization skills and improve the social competence of children with autism or autistic characteristics include: small group instruction, peer intervention, sociodramatic play, strategy and cognitive thinking, response prompting, choice-making, variation. There are three

rationales for using *small group instruction* in this research. First, small-group arrangements may prepare the child for other settings, such as general education classrooms (Fink & Sandall, 1978). Second, small-group instruction may provide opportunities for the child to learn social interaction skills (Alberto, Jobes, Sizemore & Doran, (1980), Lefebvre & Strain, 1989; Odom, Strain, Karger & Smith, 1986). Third, the child may acquire task related skills (e.g., reading words and identifying objects) through observational learning (Doyle, Gast, Wolery, Ault, & Farmer, 1990; Westling, Ferrell, & Swenson, 1982).

Peer-mediated intervention has been one of the strategies used successfully to increase social interaction between children with and without disabilities in integrated settings (Goldstein, Kaczmarek, Pennington, & Shafer, 1992). In this research, nondisabled peers are taught social behaviors or strategies to direct to children with autism. The main focus of peer intervention was to increase the social behaviors of children with disabilities by teaching peers to initiate interaction with the target children at an increased rate, thus providing them with more opportunities to respond (e.g., Odom, Hoyson, Jamieson, & Strain, 1985) or to respond to the social behaviors of the target children, thus reinforcing their behaviors and making the interactions more functional (McEvoy, Nordquist, Twardosz, Heckaman, Wehby & Denny, 1988).

Sociodramatic play has been found to be important for both social and emotional development in typical children and therefore may be a valuable skill for children with autism (Forys & McCune-Nicolich, 1984; Thorp, Stahmer, & Schreibman, 1995). Sociodramatic play is an advanced form of symbolic play in which groups of children

carry out cooperative dramatizations centred about a familiar theme. The five elements of sociodramatic used in this research were role playing, make-believe transformations, social interaction, verbal communication and persistence. According to Borkowski, Schneider and Pressley (1989) if the child's home and school environments are stimulating and include extensive *strategy* instruction, the child will come to know a number of procedures for mediating the learning of important tasks as well as when to apply them. By teaching the child to use a strategy ("look, think and talk") to increase his eye contact and verbalizations, this research encouraged the process of *cognitive thinking* to achieve improvement in social skills. The new knowledge makes the children more competent and more ready to tackle novel problems or situations with likely success (Borkowski, Schneider & Pressley, 1989).

The two types of *response-prompting* strategies used were the *most-to-least* prompts procedure and the *naturalistic* teaching procedures. Wolery, Ault and Doyle (1992) described most-to-least prompts as an instructional strategy that progressively fades the teacher's assistance while Hart and Risley (1975) define naturalistic procedure as incidental teaching used to increase communication or language skills through interactions between students and adults in natural settings. *Choice-making* related to the different roles that children were taught to role play was encouraged by the researcher. The children could choose the role they preferred for each session of role-play. Dyer (1987) showed that when children with autism were given choice of preferred rewards, a decrease were shown in stereotyped self-stimulatory behaviours. The success of using choice and preference for individuals with severe handicaps has been documented in studies showing reductions in

social avoidance behavior (Koegel, Dyer, & Bell, 1987), increases in spontaneous communication (Dyer, 1987; Peck, 1985), and improvements in task performance (Parsons, Reid, Reynolds & Burngarner, 1990).

Proponents of theory and research have also argued persuasively that organisms have a need for and are motivated by *variation* and novelty in their surroundings (Fowler 1965; Maddi, 1961). Observation tells us that children, including autistic children, are sometimes more motivated by situations that contain elements of change, variation, and novelty (as opposed to unchanging or monotonous situations). Innovative teachers have recognized this possibility and have attempted to program various surprises, schedule changes, and novel activities into their classroom curricula (Koegel, Rincover & Egel, 1982). In this research, various toys and stimuli were provided for role play. To prevent reactive inhibition from setting in and to observe the effects of varying the stimuli, some novel toys related to each role were included in the follow-up sessions.

The need for effective teaching interventions cannot be stressed enough because social awareness is an area of deficit for children with autism or autistic characteristics. Social interaction skills are high on the priority of skills to be taught to children with autism. Gresham (1986) hypothesized that social problems may begin with skill deficits such as, not possessing the skills to interact appropriately with others. Therefore this research examined two basic social interaction skills, namely appropriate eye contact and verbalizations which are vital for young children with autism or autistic characteristics to acquire in order to improve their social skills. Due to their social deficits in communication and interaction, autistic children often do not involve themselves in many

social activities and organizations. Consequently, they tend to avoid and are avoided by peers unless their social skills are improved.

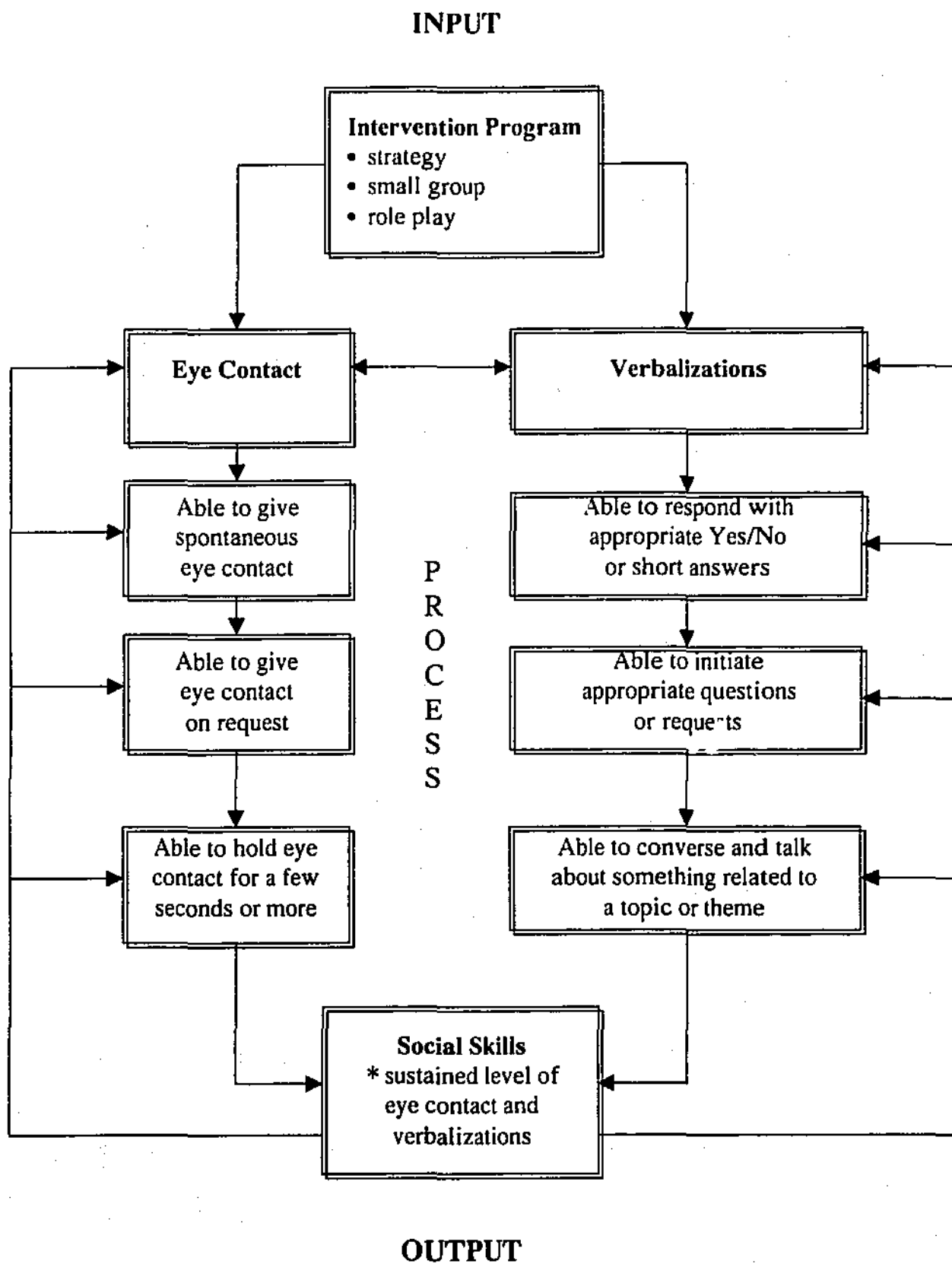
Despite the importance of these two basic interaction skills, few researchers (Bornstein, Belleck, & Hersen, 1977; Berler, Gross and Drabman, 1982) have combined the use of eye contact and verbalizations in role-play situations for social skills training. Most studies have either researched on the eye gaze of children with autism (Tiegerman & Primavera, 1984; Koegel & Frea, 1993) or their spontaneous speech and language verbalizations (Charlop & Trasoweck, 1991; Ingenmey & Houten, 1991; Matson, Sevin, Box & Francis, 1993; Schwartz, Carta & Grant, 1996). However, in social communication and interaction, eye contact and verbalizations often go together. That is, social interaction demands that persons look and talk at the same time. Therefore it is useful and interesting to find out how children with autism who have average and above average IQ would perform on tasks that require eye contact as well as verbalizations in a social context. Although the study researched by Berler, Gross and Drabman (1982) combined eye contact and verbalizations to show an improvement in role-play, they discussed the need to use teacher feedback and other procedures that are more likely to increase the probability of generalization. In the latter study, a 20-item questionnaire role-play test to rate an experimental and control group in various role-play scenes was used instead of an experimental research design to analyze the improvement for each individual child.

In the present study, the researcher has employed a *single-subject experimental research* design and analysis with six different phases of role-play conditions (A-B-C-D-E-A) and follow-ups, to implement a teaching strategy aimed at increasing the eye

contact and verbalizations and the improvement of social skills in young children with autism or autistic characteristics. The two research questions related to the study are: Can children's eye contact and appropriate verbalizations to the researcher be increased using a teaching strategy? and Does the use of role-play activities motivate children to give more eye contact and appropriate verbalizations that generalize to other social situations with children of similar age?

The conceptual framework used for this research is illustrated in Figure 1.

Figure 1. Conceptual framework of social skills



It depicts the relationships between the various components and illustrates the possible effects an intervention program on social skills. The intervention program focuses on two major areas of skills development, namely eye contact and verbal language. Eye contact can be given by the child in two different ways: spontaneously, on request. The experimenter can also measure the time allocated by the child to eye contact (Kozloff, 1974). Verbal language can be given appropriately through short answers, initiating questions and requests, and conversing or talking to others. These are the two basic interaction skills that a child, especially with autistic characteristics, needs to attain. The child needs to be able to interact and relate to other people successfully in his environment. The study uses strategy teaching, role play activities and small group interaction as the main input to facilitate the developmental processes in eye contact and verbal language so that it may lead to an increased output in terms of sustained level of eye contact and verbalizations to improve the child's social skills.

CHAPTER 2

LITERATURE REVIEW

Social skills deficit implies a lack of sensitivity to people, a lack of communication abilities and a poor perception of social situations (Lerner, 1993). One hallmark feature of autism is the profound social skill deficits displayed by these children (Kanner, 1943; Schreibman, 1988; Strain, 1983). Their difficulty in relating to people is one of the most obvious and crucial deficits (Sabornie & Beard, 1990; Koegel & Frea, 1993). Many researchers and special education practitioners (Sabornie & Beard, 1990; Taffe & Smith, 1993; Rutherford, Chipman, DiGangi, & Anderson, 1992; Oke & Schreibman, 1990; Hauck, Fein, Waterhouse & Feinstein, 1995) agree on the importance of social skills as part of the developmental instruction and consistent training necessary for children with learning disabilities and children with autism or autistic characteristics. This is because these children do not spontaneously demonstrate appropriate social behavior in different environments. Social skills training enhances students' contextual cues, demands, and expectations of their social environment (Rutherford, 1996). It involves teaching specific skills so that children learn how to read social cues and how to respond appropriately to those cues.

Children who have developed and demonstrated effective use of prosocial repertoires show higher rates of positive social behaviors, effective communication skills, better problem-solving skills, greater peer acceptance and social adjustment and overall positive self-concepts (Kelly 1982; Gresham, 1986). Autistic children and children with

ongoing social skills difficulties are regarded as an "at risk" population compared to age-mates with typical development (Taffe & Smith, 1993; Spicuzza, McConnell, & Odom, 1991; Strain, 1983). Hauck, Fein, Waterhouse & Feinstein (1995) reported in their findings that the initiations to peers differed greatly in quantity between autistic and retarded children. Autistic children initiated communication only one third as often as retarded children, and engaged in more routinized rather than playful initiations. They also tend to make more social initiations when forced into proximity with peers rather than in an unstructured situation.

Studies of preschoolers' social behavior (Ladd, Price, & Hart, 1988; Mize & Ladd, 1990) support observations of the relationship between social behavior and later social pathology. Problems with social competence seen in kindergarten may persist into adulthood (Vaughn, Hogan, Kouzekanani, & Shapiro, 1990; Gerber & Reiff, 1994). The negative influence of social skill deficits is reflected in heightened risk among adolescents and adults for school dropout (Ullman, 1957), psychiatric dysfunction (Cowen, Pederson, Babigian, Izzo, & Trost, 1973), and juvenile delinquency (Roff, Sells, & Golden, 1972). Autistic children generally do not see or feel the need to interact socially. They also lack the maturity to differentiate which responses are appropriate for which social situations because they lack social insight and social problem solving skills. So there is a need to teach these children strategies to learn how to interact better socially, as well as design learning opportunities to improve their social skills through training and interventions.

Research evidence supports the use of social cognitive strategies which coach the

child to perform a task successfully (Taffe & Smith, 1993). According to Lauth and Wiedl (1989), studies in which cognitive strategy interventions were applied and evaluated in real classroom settings have produced promising results, so implementation of these methods should also take place in special education. Borkowski, Schneider and Pressley (1989) also discussed the importance of acquiring metacognitive skills (thinking about one's own thinking) by using strategies to mediate performance. Knowledge of a strategy prompts children to use the strategy and makes them more competent, and more ready to tackle novel problems and situations with success. The child is taught what to do or what to say step-by-step and to think aloud or verbalize their own thoughts, like "What is my problem?", "What am I supposed to do?" (Camp & Bash, 1985).

Researchers have also found that social skills training should include descriptive procedures that highlight the skills to be learned, opportunities for teacher modeling of the skills, practice with teacher feedback and self-control (Schumaker & Hazel, 1984; Rutherford, 1996). In this research, the strategy of *'look, think, and talk'* was used in the teaching interventions to help each child increase his eye contact and verbalizations.

Bloom and Lahey (1978) posited that early communicative behaviours are precursors to language acquisition and gaze interaction. These have been described as prelinguistic acts that enable the child to develop and engage in more complex forms of communicative interchanges or communication. According to the DSM-IV classification of pervasive developmental disorders, children with autism or autistic characteristics have impairment in social interaction as manifested by marked impairment in the use of multiple nonverbal behaviours such as eye-to-eye gaze, facial expression, body postures

and gestures. Kanner (1943) reported that the autistic child "never looked into anyone's face". Hutt and Ounsted (1966) also observed this and argued that it was due to specific and active avoidance of eye contact; they interpreted this "gaze aversion" as a "cut-off act" and as one expression of a wider tendency to avoid social interaction. Quantitative studies measuring the amount of time spent in looking at subjects by Castell (1970) and O'Connor and Hermelin (1967) found that autistic children engage in less eye contact with an adult than normal children. Churchill and Bryson (1972) found that autistic children looked more at an adult who looked and smiled at them than at someone presenting his profile. Richer and Coss (1976) found that in response to being looked at autistic children looked less and in shorter bouts than did normal children, and that they showed more flight behaviour when they averted their gaze.

Kozloff (1974) described the procedures needed to teach children to give eye contact spontaneously on his own, to give eye contact on request when they are asked to, and to increase the length of time the children hold their gaze. To encourage this behaviour, tangible rewards like small bites of food were used initially, then gradually substituted by intangible rewards like praises and the child's preferred activities.

In the experiment conducted by Tiegerman & Primavera (1984), the researchers attempted to modify the gaze behaviour of autistic children. The research investigated three kinds of adult-child interactions that differentially affected changes in the gaze behaviour of six autistic children. The findings revealed that the children initially interacted with various objects without looking at the experimenter's performances. However, as a result of the procedures, the children became more aware of the

experimenter's performance, as indicated by an increase in the frequency and duration of gaze behaviour. In another piece of research by Koegel and Frea (1993), the autistic child who displayed low eye gaze at baseline showed a marked improvement from near 0% to near 100% of appropriate eye contact after treatment. Self-management procedures, reinforcements in the form of tokens for child's choice of video games and fading procedures were used at a community setting. The child was required to look and converse with the treatment provider before a single reinforcer was given. The interval length was increased steadily from 1 minutes to 7 minutes. The results led them to conclude that high-functioning children with autism were able to modify their social communicative behaviours during conversational interactions following training and that social-skills problems characteristic of autism respond well to treatment.

According to the DSM-IV classification of pervasive developmental disorder, children with autism or autistic characteristics have impairments in communication as manifested by a delay in, or a total lack of spoken language. Even if the individual has adequate speech, there is marked impairment in the ability to initiate or sustain a conversation with others. Autistic children tend to speak only when spoken to and seldom initiate appropriate speech (Carr & Kologinsky, 1983; Lovaas, 1966). However, Wing (1976) noted that as the autistic child grows older appropriate social behavior increases, especially if functional language skills increase. On this basis, there is a need to increase the use of appropriate spontaneous language and verbalizations of children with autism to promote increases in their prosocial behavior. A key finding in Hauck, Fein, Waterhouse and Feinstein's (1995) study is that, within the autistic group, the frequency

of social initiation to peers is predicted not by severity of symptomatology but by cognitive, especially verbal, factors.

Many researchers (Charlop, Schreibman, & Thibodeau, 1985; Schreibman, Charlop & Tryson, 1981; Ingenmey & Houten, 1991; Coe, Matson, Fee, Manikam & Linarella, 1990) used time delay to teach autistic children to request desired objects, appropriate items, or play activities spontaneously (e.g., "I want slide", "Play ball"). Intervention consisted of a gradual delay in the presentation of verbal prompts, natural stimuli and functional behaviours. Most results showed increases in spontaneous speech that generalized across settings or persons. In Charlop and Trasowech's (1991) research, three echolalic boys, aged seven to eight years old quickly acquired and maintained contextually appropriate spontaneous speech in the form of greetings (e.g., "Good morning Mommy", "Hello", "How are you?"). Matson, Sevin, Box and Francis (1993) used time delay and visual-cues in their research to compare both methods' effectiveness in increasing self-initiated verbalizations in autistic children. Large brightly coloured cue cards were used to train verbalizations (e.g., "excuse me", "play with me", "help me", "thank you") because the verbal behaviour of all three participants consisted almost entirely of echoing modelled phrases and limited responding to verbal prompting. Their behaviours were relatively stable at high levels of responding by the end of treatment. The time delay procedure has been a successful treatment to date and the visual-cue was included as an alternative strategy. However, the researchers found that both methods were effective in increasing self-initiated verbalizations in autistic children.

In another study, Loveland and Tunali (1991) used modelling of appropriate behaviour and social scripts to promote conversational interactions in 13 high-functioning verbal individuals with autism (aged between 5 and 27 years). According to Fivush and Stackman (1986) and Nelson (1986), sets of expectations for human behavioural events can be described in terms of scripts. For example, events such as ordering food in a restaurant have characteristic participants, props and verbal routines. However, persons with autism might be expected to have difficulty developing an awareness of social scripts and applying them to everyday situations. To behave appropriately in many social situations, the individual must be able to detect the nature of the situation and identify the social script that applies (e.g., someone just passed the salt, therefore it is time to say "thank you"). Results of the study suggest that autistic persons were not necessarily unable to use social scripts to guide behaviour. The findings on the effect of modelling suggest that when modelling was provided, some autistic individuals can respond appropriately within the relevant social script. Interestingly, autistic subjects' improved responses facilitated by modelling were not mere echoes or direct imitation of the modelled behaviour. After modelling (e.g., That's terrible; all your money's gone!) most autistic subjects produced their own unique responses which were still appropriate (e.g., You lost your money; go tell your mom). These responses imply that the subjects understood the nature of the situation to which they were responding. To engage in conversations and verbalizations, autistic children also need to learn question-answering skills.

Several studies have demonstrated that children with language delays can be taught to ask questions (Twardosz & Baer, 1973; Wilcox & Leonard, 1978; Zimmerman & Pike, 1972). The findings by Taylor and Harris (1995) indicated that children with autism can be taught to ask the question "What's that?" when novel stimuli were presented during an instructional task. It also revealed that question-asking can be a useful skill that leads to the acquisition of new information. Therefore frequent exposure to recommended language intervention strategies are more likely to result in greater language gains in children with disabilities (Schwartz, Carta & Grant, 1996). However, in order for teaching interventions to be effective and productive, the group size should be kept small as suggested by Shaw (1981) or based on a one-on-one format. In this research, both types of instructional arrangements were used.

The one-on-one format was used when the researcher in this study was teaching the strategy of "look, think and talk" to the child and modelling those behaviours during the role play sessions. This was effective in obtaining attention and concentration from the child during the learning process. When peers were included, the interventions were carried out as "small group time". The rationale for using small-group instruction is that it prepares the child for other settings (Fink & Sandall, 1978), allows the child to learn interactional skills with peers of similar age (Lefebvre & strain, 1989; Odom, Strain, Karger & Smith, 1986) and sets the stage for observational learning to occur (Doyle, Gast, Wolery, Ault & Farmer, 1990). A theory formulated by Schutz (1955) holds that people orient themselves toward others in certain characteristic patterns, which are major determinants of interpersonal behaviour.

The hypothesis put forth by Shaw (1981) seems to suggest that group members somehow exert an influence on their fellow members which lead to behaviour that would not occur when members are alone. The mere presence of others increases the motivation level of a performing individual and studies of social facilitation have revealed that individuals perform better in the presence of others than when they are alone. The three factors of proximity, contact and interaction are closely related. Proximity makes it possible for the child to come into contact and interact with others, and such interaction makes it possible for them to learn about the characteristics of others. Group processes enhance the social sensitivity of the child. Social sensitivity refers to the degree to which the individual perceives and responds to the needs, emotions and preferences of the other person. This sensitivity to others has been labelled empathy, insight, social judgment, and the like; and these characteristics are positively correlated with acceptance in the group and amount of participation. Shaw (1981) hypothesized that participants in experiential groups perceive changes in their feelings and behaviour as a consequence of the group experience. Studies were also consistent in showing that individuals report changes in their feelings and behaviour following participation in experiential groups.

In the research by Meyer, Klein and Genishi (1994) the researchers used "small-group time" to study peer relationships among four preschool second language learners. The Korean children entering an American preschool were challenged by unfamiliar social and communicative expectations that limit them from full participation in the classroom. Their participation was facilitated by a teacher who guided them into further involvement

to experience the benefits of small-group activities and eventually become participants of the whole group in the classroom. In such peer learning groups, the underlying assumption is that members of peer groups contribute to each other's academic achievement. The evidence suggests that working together facilitates learning. That students are capable of helping each other in the learning process is not a new idea, of tutoring by more advanced or more capable students (Shaw, 1981).

Peers are often used as agents for improving social behavior in children with learning disabilities or behavior disorders and autism. Most studies of peer influences on social development have been conducted in play settings and have been designed to affect play, language or social behavior (McHale & Olley, 1982; Meyer, Klein & Genishi, 1994, Fowell, Lawton, 1992, Hartup, & Moore, 1990). The development of positive interaction skills through peers form the foundation for positive peer relationships and friendships in later life (Guralnick, 1981). Children also acquire a wide range of competencies during peer interactions, including resolution of conflicts, sharing play materials, enacting dramatic play roles, and displaying or responding to social affection (Hartup, 1983). By using a teacher and peers to interact with the children in this research, it applies Vygotsky's (1978) social learning concept of "zone of proximal development" where the zone is described as the potential level of performance or achievement that the student can reach when assistance is provided. It can also be seen as the "expert and novice" approach to learning or "cognitive apprenticeship", such as learning through observation, modelling, coaching and fading, scaffolding, and guided practice (Collins, Hawkins, & Carver, 1991).

Peer social initiations can be used to train socially competent peers to initiate interaction with handicapped children. Peers are taught to initiate play by utilizing effective approach behaviours: play, sharing and assisting. Research has identified social initiations most likely to elicit a positive response (Tremblay, Strain, Hendrickson, & Shores, 1981) and the findings by Hauck, Fein, Waterhouse and Feinstein (1995) suggest that the frequency and type of social initiation to peers may be a useful marker of social development in autism. Several experiments have used these techniques to successfully increase target children's social behaviour (Ragland, Kerr, & Strain, 1978; Strain, 1983; Strain, Kerr, & Ragland, 1979). These studies have demonstrated the effectiveness of peer social initiations in increasing autistic children's positive social responses. However, autistic children's social initiations tend to remain at a low rate (Odom, Hoyson, Jamieson, & Strain, 1985). Both initiations and responses are components of social interaction; that is, social interaction is reciprocal. Autistic children must learn not only to respond appropriately to the social initiations of peers but also to initiate interaction (Oke & Schreibman, 1990). In their research, they reported that the disruptive behaviour of an autistic boy remained unchanged when the non-disabled peers were trained to initiate interaction with him, but decreased when he was taught to initiate interaction. Thus the intervention increased both the rate of the child's positive initiations and the amount of positive social interaction.

A script-fading procedure used by Krantz and McIannahan (1993) was used successfully to increase the levels of peer initiations to within the same range as a normative sample of non-disabled youngsters. It enabled the participants who had severe

social and verbal deficits to practise context-specific, peer-directed generative language that was not prompted by adults or peers. The encouraging results were similarly seen in two other children with autism who maintained prolonged interactions with their peers, initiated play and conversations, and increased engagement in language and joint attention behaviours after intervention (Pierce & Schreibman, 1995). Two experiments conducted by Haring and Lovinger (1989) taught three autistic preschool children to initiate play by teaching them to share specific toys. They found that play initiation training increased the level of the autistic children's initiations and increased the responsivity of the peers to their initiations.

A teaching intervention that involved sociodramatic or role play was used to facilitate the use of both eye contact and verbalizations in young autistic children. Sociodramatic play has been found to be important for both social and emotional development in typical children (Forys & McCune-Nicolich, 1984) and therefore may be valuable for children with autism (Thorp, Shahmer & Schreibman, 1995). "Sociodramatic play" is defined as play that involves voluntary social role-taking with others (Wolfgang, Mackender, & Wolfgang, 1981) and is typical of 3-5 year olds (e.g., playing doctor with doctor's toys, playing house with "dress up" clothes or washing dishes with no water in the sink). These roles tend to be reciprocal in that they reflect complementary social relationships, such as a salesperson and a customer or a parent and child (Fein, 1981). Howe, Moller, Chambers and Petrakos, (1992) researched on the ecology of dramatic play centres and children's social and cognitive play. A basic premise of the traditional nursery school curriculum is that play facilitates young children's development (Clarke-Stewart & Fein,

1983; Monigham-Nourot, Scales, Van Hoorn, & Almy, 1987). Thus, early childhood education curriculum experts include dramatic or pretend play centres in preschool settings (e.g., Hendrick, 1988).

Speer and Douglas (1981) recommended role play activities as one of the ten tips for helping learning disabled children improve their social skills effectively, due to the possible effects of verbal interactions and the emotions that they may arouse in others and themselves. There is theory and research evidence in support of using play to facilitate social skills and language development in young children (Garwood, 1982; McHale & Olley, 1982; Mindes, 1982; Levy, Wolfgang & Koorland, 1992; File, 1994). According to Mead (1934), the concept of the self and the awareness of another's view of self, both of which are basic to social development, develop during play situations. Especially in pretend play, when children act out the roles of others, they learn to view themselves subjectively and objectively at the same time. That is, they learn to play a role and think simultaneously about the role they are playing. In time, children generalize this understanding to everyday social experience. Smilansky (1968) discovered that sociodramatic play training encouraged more complex and more frequent verbal communication as well as more socially adaptive behavior (e.g., more positive affect and less hyperactivity and aggression).

Freyberg's (1973) finding with poor urban children were also consistent with Smilansky's results. Wolf and Grollman (1982) argue that during pretend play, young children make sense of their personal experiences and their culture, thus providing children with opportunities to act out familiar scenarios which is developmentally

beneficial for children. Recent studies conducted by Schwartz, Carta and Grant (1996), showed that the children who made greater language gains were more likely to be in classrooms that provided more pretend play materials and more frequent exposure to language intervention strategies. Other studies (Goldstein, & Cisar, 1992; Levy, Wolfgang & Koorland, 1992; Thorp, Stahmer, & Schreibman, 1995) also used sociodramatic play as a method to promote language performance in children with autism or learning disabilities. The researchers found that children with disabilities use more total words in conversation, increase the mean length of their verbalizations, use more vocabulary words specific to a defined theme of play and use an increased number of words indicating concepts of colour, shape, number, quantity, space, and time (Levy, Wolfgang, & Koorlang, 1992; Genishi & Dyson, 1984). The improvement in the autistic children's language skills and social behaviour also generalized across toys, settings, and individuals (Thorp, Stahmer & Schreibman, 1995). The results in Goldstein and Cisar's (1992) research provided evidence that the children were not simply performing by rote, but demonstrated some creativity. The profound impairment in the social behaviour of autistic children (Rutter, 1978) include a striking lack of symbolism in their play behaviour (Baron-Cohen, 1987).

In the above studies, most researchers include the following elements of sociodramatic play: imitative role play (mirror speech or actions of teacher and peer), imaginative role play (e.g., pretending to be a fireman, dad, Ninja Turtle), make-believe transformations (in regard to objects as well as actions and situations, like pretending a block is a telephone or pretend to open a nonexistent door), persistence of play for a

duration of time (number of minutes), social interaction (comply with request or demand, initiate question or play), and verbal communication (spontaneous speech and other appropriate vocalizations). Numerous studies have focussed on the relationship between verbal communication and play. Vygotsky (1966) believed play was the primary medium through which language developed, while research on the correlation between language and play has led to the suggestion that training imaginative play may be a means to increase language skills (Jeffrey & McConkey, 1974; Morehead & Morehead, 1974; Stahmer, 1995).

Children with autism have been shown to be more successful in learning initial words and language (R. L. Koegel, O'Dell & Koegel, 1987) and to engage in longer periods of sustained conversational interaction (R. L. Koegel, Dyer, & Bell, 1987) when their interests are considered. As a whole, these studies indicate that a number of different populations of children with language disabilities and targeted linguistic areas could benefit when considering the child's interest and incorporating child-preferred activities in language intervention programs ((R. L. Koegel & L. K. Koegel, 1995). Ability to increase mands verbally (e.g., saying "play") or by touching the "play" card on more than 70% of the intervals when the child was prompted to work have been reported in the study concerning choice making by Peck, Wacker, Berg, Cooper, Brown, Richman, McComas, Frischmeyer and Millard (1996).

In the study by Dyer, Dunlap and Winterling (1990) the children were provided with opportunities to choose from the available selection of tasks and reinforcers. They indicated their selections verbally or by pointing. If the child voluntarily requested a

change in materials, such a change was permitted. The children who participated in this study appeared to have preference for specific tangible reinforcers. Results indicate that aggressive behaviour was either absent or considerably lower in the 'choice' conditions compared to the 'no-choice' conditions, and suggest that choice making options provide a simple strategy that can be used to reduce serious problems exhibited by students with severe handicaps. From an applied standpoint, it is important for clinicians to have a variety of potential reinforcers available and be able to predict the relative effectiveness of those stimuli as reinforcers (Piazza, Fisher, Hgopian, Bowman, & Toole, 1996). It seems that child choice needs to include a variety of activities and items. That is, children learn more rapidly if a pool of stimulus items are selected and varied from trial to trial according to the child's interest. In addition, interspersing maintenance tasks, or tasks the child has already mastered, results in improvements in responding. As well such choice results in better behaviour, more happiness, and higher interest (R. L. Koegel & L. K. Koegel, 1995).

Work on antecedent (instructional) stimulus novelty and variation has been conducted with developmentally disabled individuals. Young (1969) demonstrated that novel stimuli attracted increases in the visual fixations of autistic children. Zeaman, House and Orlando (1968) found that the insertion of novel stimuli into otherwise unchanging tasks significantly improved the performance of retarded children. Dunlap and Koegel (1980b) suggested in their research that instructional variation might prove influential in improving the children's motivation, responsivity and task performance. Variation in task or material can have a dramatic effect on the child's emotions during learning. The

data obtained showed the higher functioning autistic child achieving higher levels of enthusiasm, happiness, interest (in the task) and general behaviour (on-task versus off-task behaviour).

In the present research three high functioning autistic boys were presented with a variety of training material to utilize in their role play, including novel items in the follow-up intervals. They were also allowed to exercise choice making decisions with regards to the various roles (e.g., doctor, waiter, postman) to be played for the intervention sessions. Based on the results of researchers who have worked with autistic children, using small-group interventions with peers through sociodramatic play and procedures that include a teaching strategy, choice making and variation, this research attempted to increase the level of performance of eye contact and verbalizations for each of the three participants. Therefore, a single-subject experimental research design was selected in order to establish a baseline for each child to allow repeated measurement throughout the interventions and to assist maintenance for each child separately (Neuman & McCormick, 1995). The features of this research methodology are similar to qualitative models of inquiry and patterns of analysis where there is the advantage of ensuring that changes in responses are indeed the result of the intervention and not a consequence of chance or other factors.

CHAPTER 3

METHODOLOGY

The three studies in this research used the single-subject experimental research design. The study involved three boys who met the DSM-IV criteria for autism. The aim of single-subject experimental research is to establish the effects of an intervention (that is, an independent variable) on a single individual (Neuman & McCormick, 1995). This design was employed because it enabled the present researcher to analyze and describe the variability in individuals more precisely than is possible with group experiments. In group-based studies, statistical tests and reporting average differences for groups may have little meaning (Neuman & McCormick, 1995). Single-subject design stressed the fact that there are important differences among individuals and each individual can serve as his or her own control. Therefore, by using the single-subject experimental research design, it was able to provide a more integrated and detailed analysis of the impact of interventions for each child (Neuman & McCormick, 1995; Kratochwill & Levin, 1992). Many authors have discussed single-subject methodology as a specialized research application in special education (Tawney & Gast, 1984) and communicative disorders (McReynolds & Kearns, 1983).

The research methodology used in the present study was consistent with a single-subject or time series paradigm. First, *baseline* data were gathered for each subject during an initial phase of the research in which all the conditions were carefully controlled so that they differ from the later phases in only one way: intervention procedures were absent. That is, the researcher collected data based on observations of

how each child performed in the dependent variables: verbalizations and eye contact before a teaching strategy was introduced. Second, following baseline, there was repeated measurement of the variables throughout the intervention and the follow-up over a prolonged period of time. Third, *variability*, defined as the degree to which an individual's responses vary from time to time under the same experimental conditions (Neuman & McCormick, 1995; DeProspero & Cohen, 1979) served as a control procedure to establish data stability. For this research, there was intrasubject variability, that is variability within an individual subject. Fourth, the standard measurement procedures used were *observational recording*, *event recording* (e.g. number of appropriate verbalizations) and *duration recording* (e.g. total length of eye contact time).

Fifth, *internal validity*, which is the ability to attribute an effect to a given cause and the degree to which findings of an experiment can be ascribed to the intervention and not to faults in the study's methodology (Neuman & McCormick, 1995) was assessed using interobserver agreement for both the dependent and independent variables. Sixth, *visual analysis* of data was based on the visual inspection of the data displayed on the graphs maintained throughout the study. It involved the comparison of the data points on the graphs for each child to determine if a change has occurred, the magnitude of the change, the trend of the change, the latency of the change and the reliability of the change (Neuman & McCormick, 1995). Therefore, it represents legitimate exploratory-research vehicles for communicating what "is interesting to the eye" or what "merits further study" (Parsonson & Baer, 1992). Seventh, *external validity* which pertains to generalizability was established through systematic replication (i.e., using the same

design and teaching interventions with three autistic boys individually). Generalizability requires direct replication of the same experiment with different subjects who have characteristics similar to those in the original group (Barlow & Hersen, 1984). Eighth, *trend lines*, which refer to the effects of ascending, descending, flat and variable paths in the data (Kratochwill & Levin, 1992) were investigated to increase understanding and agreement about level and trend changes in the graphs.

This single-subject experimental research used an *interrupted time-series design*. It means a contrast of pre- and post-intervention levels of dependent-variables over time (Campbell 1963; Cook & Campbell, 1979; Glass, Willson, & Gottman, 1975) to determine whether the intervention has had an impact on the dependent variables (McDowall, McCleary, Hay, & Meidinger, 1980).

The three studies in this research also used a partially *reversal design* (Barlow & Hersen 1984; McReynolds & Thompson, 1986; Neuman & McCormick, 1995) employing three of the four procedures used in a reversal design. First, baseline data were taken for specific types of responses (e.g., verbalizations and eye contact) before the intervention. Second, the intervention was then initiated for a period of time and data were taken on the same type of responses. Third, the intervention was withdrawn for a short time to see if the responses went back to the baseline level. Follow-up sessions were conducted after the return to baseline instead of reinstituting the intervention again.

The study used an A-B-C-D-E-A design with the first child, an A-B-C-D-A design with the second child, and an A-B-C-A design with the third child. A was the baseline, and B, C, D, and E were the teaching interventions and conditions. The designs

examined the causal relationship between the independent and dependent variables. It was based on the principles of behavior modification in which a teaching strategy was used in the interventions to attempt to effect an improvement in the children's social skills through the increased use of appropriate verbalizations and eye contact. The two dependent variables being measured were the number of appropriate questions or responses made by the child, and the total length of time the child used eye contact within an observation or testing time (see Table 1 for the criteria in determining what was an appropriate verbalization and eye contact). The independent variable was the conditions under which the child was required to interact with others (see Table 2).

Participants

The three boys involved in this research were diagnosed as meeting the criteria for autism under DSM-IV classification. They had an impairment in social interaction and verbal communication as well as stereotyped patterns of behavior, interests, and activities. In order to obtain a relatively homogeneous sample of children for the research, the boys IQ scores ranged from 110 to 117 and were considered by child psychologists and therapists to be cognitively higher-functioning autistic children. They were also between the ages of five to seven years and have been attending kindergarten classes at a child care centre for at least 6 months.

Table 1 - Criteria for determining appropriate eye contact and verbalizations

Appropriate eye contact: Looking at the researcher or peer while giving verbalizations.

Inappropriate eye contact: Looking away from the researcher or peer while giving verbalizations, looking at the ceiling, eyes roaming around the room, eyes preoccupied or fixed on play materials, or simply staring without verbalizing as an indication of difficulty in relating to people, in comprehending or attending to the social situation.

Appropriate verbalizations: Questions, answers or verbal responses that are asked, answered or said in a clear and meaningfully used context, grammatically correct and polite manner.

Examples: "This letter is for you", "Here's your parcel", "You want some stamps?"

"Hello, what do you want to eat?", "Do you want a hamburger?",

"I don't have strawberry ice-cream", "Do you want sugar?", "Bye-bye",

"Do you have fever?", "Open your mouth", "Let me check your eyes",

"What's wrong with your car?", "Your car has a flat tyre",

"Did any robber steal your money?", "How much?", "What time?",

"I'll catch them", etc.

Inappropriate verbalizations: Questions, answers or verbal responses that are ambiguous, out of context, given in an abrupt or rude manner or echolalia (repeating exactly what the peer had said).

Examples: "I want to eat", "You want?", "Medicine" (ambiguous),

"Mummy will come", "The phone is ringing", "Teacher Ann" (out of context), "Time's up!", "No!", "Okay!" (abrupt or rude), etc.

Table 2 - Conditions in which child is required to interact

Phase	Description
A	Baseline - no teaching intervention
B	Teaching intervention - child with researcher and feedback
C	Teaching intervention - child with researcher and no feedback
D	Teaching intervention - child with one peer
E	Teaching intervention - child with two peers
A	Return to baseline - withdrawal of teaching intervention

Peer Training

Two normal peers were trained to provide peer interaction during role play for the first child. One normal peer was trained for the second child and another trained peer for the third child. All the peers were given one training session prior to intervention. They were chosen on the basis of their friendship with the participants, their social competence and their maturity (i.e., able to verbalize and hold conversations, display readiness and confidence in social skills, and willingness to participate).

Setting

The interventions and observations for each boy were conducted at two locations, a training room at the clinic or special school and another room or corner at the child care centre. The rooms were set up with a child-sized table and chairs for all the sessions for role-play activities.

Materials

Hats and toys belonging to different professions were used in the role-play activities. For example, playing doctor with stethoscope, thermometer, medicine bottles; playing waiter with crockery, cutlery, various kinds of food; playing postman with letters, parcels, stamps; playing policeman with a pen and writing pad; and playing mechanic with play tools and so forth. A video camera and recorder were also used to tape the teaching and testing sessions for all the phases from A to E, including the follow-up. The recorded data were used for data collection and inter-observer reliability.

Procedure

All the sessions except baseline were designed with a teach-test-teach-test format that consisted of 2-minutes of teaching and 2-minutes of testing. Five sessions were conducted for each phase and each follow-up. A total of 40 sessions for the first child (A-B-C-D-E-A and two follow-ups), 30 sessions for the second child (A-B-C-D-A and one follow-up) and 25 sessions for the third child (A-B-C-A and one follow-up) were conducted. The strategy of "Look, Think, and Talk" was taught in the teaching interventions to help the children remember to give appropriate eye contact and verbalizations. At the beginning of each teaching session, the researcher prompted and modelled the role-play with appropriate eye contact and verbalizations. At the beginning of each testing session, the researcher prompted the start of the role-play by saying "Let's play.....it's your turn". In conducting the intervention sessions for the various phases, two types of response prompting strategies were used: the most-to-least prompts procedure

(decreasing assistance and feedback) and the naturalistic teaching procedure (incidental teaching).

Recording of data

Data was collected through viewing the video tape. The researcher and independent observers recorded the number of appropriate verbalizations and the total length of eye contact per 2-minute interval on data collection sheets for the test sessions for data analysis (see Table 3).

Table 3 - Sample data collection sheet

Name of child: _____															Age: ____ years ____ months																					
Phase: _____ (A-baseline, B, C, D, E, or A-return to baseline)																																				
Session No. _____ (1 - 30)										Date: _____										Time: ____:____ to ____:____																
Tick each box for 1 appropriate question, answer or verbal response given by child																																				
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15																																				
No. of appropriate verbalizations within 2 minutes																																				
Write in each box the no. of seconds for each appropriate eye contact given by child																																				
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15																																				
No. of seconds per eye contact																																				
Total no. appropriate verbalizations: _____															(questions/answers/verbal responses)																					
Total length of eye contact time: _____															(seconds)																					

Inter-observer reliability

Inter-observer reliability was calculated for 20% of the sessions for each child, across all the phases including the follow-up for both dependent variables by measuring the occurrences of eye contact (in seconds) and the number of appropriate verbalizations. One session was chosen from each phase and follow-up on a random basis. The percentage of agreement was obtained by totalling up the number of verbalizations or seconds of eye contact recorded by the researcher, dividing it by the total number of verbalizations or eye contact recorded by the independent observer and multiplying it by a 100. The independent observers were child psychologists and therapists who have worked with the participants. Data for the calculation of percentages of agreement were based on data collected from viewing the videotape.

CHAPTER 4

STUDY 1

Introduction

Samuel (a pseudonym) was the first child involved in this research. He is six years old and he is the second child in the family. Samuel has an elder brother, eight years old. His brother is often seen as a role-model for both Samuel's personal and socializing behavior. Both his parents work full-time and Samuel is cared for by the housemaid when they are busy or away at work. They usually spend time playing educational games and activities with him. They also provide support by engaging in both incidental and structured learning as recommended by the therapist and psychologist.

Samuel's formal assessment was completed by a clinical psychologist using the Leiter International Performance Scale (Leiter, 1948) and the Wechsler Preschool and Primary Scale of Intelligence Revised (WPPSI-R) (Wechsler, 1974). On the WPPSI-R, Samuel obtained an IQ score of 111. The performance scale IQ (PIQ: 126) was better than the verbal scale IQ (VIQ: 98). Samuel has attended the same Child Development Centre (a full-day child care and preschool in Singapore) since the age of 3 years. He has also been seen by a speech therapist and clinical psychologists between the ages of 3 and 6 years. He has been diagnosed as a high functioning autistic boy with a highly developed memory. The speech therapist also considers Samuel to fit the criteria of an autistic child with Asperger's syndrome. At the age of three, he was observed to be hyperactive, impulsive, lacking in social interactions and not communicating well verbally. He hardly played with his peers or took part in group activities. He also had

the tendency to wander off or look out of the window frequently. Samuel displays an early interest in reading, characterized by effortless acquisition of oral reading. He could read at the level of a five year old when he was three years and eight months. He is very fluent in his oral reading, but cannot comprehend well what he has read, or answer complex questions based on what he has read besides giving direct and obvious answers.

Some of Samuel's obsessive behaviors include staring at spinning fans including air-conditioners, dropping coins into vending machines, pressing buttons at the ATMs (Auto Teller Machines) and flushing toilets. He is also very particular about order and any change in the order or routines that he is used to may upset or frustrate him.

Some of Samuel's fears include loud noises and crowded places. He will react by covering both his ears with his hands, constantly insisting on leaving the premises or occasionally giving way to tears and emotional outbursts.

To help him develop better social skills, intrusion into his 'own world' needs to be made consciously and purposefully. Caregivers need to join his play and direct others to join his play.

Over time, Samuel has shown improvement in the above areas because he has participated in interactive groups at the local children's hospital in the areas of waiting, turn taking, requesting, completing tasks and reasoning. All these activities were aimed at helping Samuel improve his social and cognitive skills which are vital for mainstreaming him into a regular educational setting eventually. However, Samuel still needs to be taught how to play actively with his peers through a series of structurally planned activities to continue to improve his social skills with his peers, especially the

amount of eye contact time and the number of verbalizations he is able to give to his peers during play.

Samuel's speech has shown some improvement, although more work needs to be done in the area of requesting and reasoning. Echolalia is present, with some self-talk. However, the tendency and frequency has decreased considerably after corrective interventions by the speech therapist. Samuel has difficulty in negotiating with other children during play or work and appears unaware of others' emotions. He also has difficulty in conducting a conversation with another person, in either following or shifting the topic of conversation without displaying inappropriate impatience and persistence. There is a need for him to improve in his ability to initiate questions and answers appropriately and to do so in a less abrupt and rigid manner (by being more observant, sensitive, and responsive to the other person's facial expression and answers given).

Samuel has the above problems and manifestations associated with an autistic child. However, he has a deficit in two key areas - which is the tendency not to look and pay attention to others in a social context and the tendency not to respond appropriately and verbally while he is in a social context.

The methodology in this study was based on a single-subject case-study which followed an A-B-C-D-E-A design with follow-up sessions. A was designated as the baseline and B, C, D, E, were the teaching intervention phases of the study. Two trained peers of similar age were used in the teaching interventions and an older trained peer (Samuel's brother) was used in the second follow-up sessions. Each teaching

intervention session was conducted with a teach-test-teach-test format and all the sessions were recorded on video for data analysis. Data collected were based on the number of verbalizations and the total number of seconds of eye contact that Samuel exhibited within each 2-minute session. The results showed that both Samuel's verbalizations and eye contact improved after the teaching interventions. The average number of appropriate verbalizations he was able to give increased by 2.5 times, from 3.2 at baseline to 8.6 for the return to baseline. His verbalizations continued to increase in the follow-up sessions to an average of 20.2. Samuel's average total length of eye contact increased by 3 times, from 0.49 seconds at baseline to 3.6 seconds for the return to baseline.

Method

Peer training

The participant in this study was a 6 year old boy named Samuel who was diagnosed as having autistic characteristics in his social behaviour. Two normal boys, Wilson and Luke (pseudonyms) both of the same age as Samuel were trained as his partners for the peer interventions. Both peers are Samuel's classmates at the Child Development Centre. The peers were chosen on the basis of their social competence (ability to verbalize and hold conversations), maturity (confidence in social skills) and willingness to participate. Samuel's 8-year-old brother also participated as a trained peer during the second follow-up. He was chosen for the purpose of measuring Samuel's performance with an older peer, for observing if Samuel could apply the skills he has learnt to a different but familiar person like his brother, and whether there was any difference in Samuel's performance while role-playing with a sibling compared to a classmate.

The peers were given one training session prior to the first intervention session of each phase. They were shown how to play the different roles with the respective training material. The same teaching intervention was used to teach the peer. The researcher taught the strategy and modelled each role before asking the peers to emulate the activity. Instructions were also given to help the peers guide the participant in the role-play. The researcher said to the peers: "Wilson, you must ask Samuel questions so that he will answer", "If he starts to take things on his own without asking, you must make him ask you by saying - please ask me first", "Luke, if Samuel gives you something that you don't want, make him ask again by saying - No, I don't want this".

Setting and training material

Training and teaching interventions took place during regular school days whenever the other class children were having their outdoor play or rest-time. The room was set up with a children's table, two stools, and a small low cupboard. Training material used were toys with which the child and his peers could readily play during role-play sessions. They included: hats belonging to different occupations (e.g. policeman, postman, waiter, doctor and mechanic), accessories and peripherals (e.g. pen and paper, necklaces, watches, rings, wallets, parcels, letters, stamps, cards, basket of fruit and food items, crockery set, tea and coffee set, eating utensils, medical kit with stethoscope, thermometer, medicine bottles, keys, drill, spanner, screwdriver, etc.).

A video recorder was used to tape the baseline observations, teaching sessions, testing sessions and the follow-up. A cassette recorder was also used as a backup and accuracy check.

Design

The research study used an A-B-C-D-E-A design with Samuel and included two follow-up sessions. A was the baseline, and B, C, D, and E were the various teaching interventions and conditions. The conditions or independent variables under which Samuel was required to interact with others were the same as those listed in Table 2. The two dependent variables were the number of appropriate verbalizations made by Samuel, and the total length of time (in seconds) Samuel gave eye contact when interacting with his peer(s) within each two-minute interval.

Procedure

Phase A was the baseline where the researcher observed and recorded data for five 2-minute sessions of Samuel's role play. Phases B, C, D and E were conducted with a teach-test-teach-test format that consisted of 2-minutes teaching and 2-minutes testing. Five sessions were conducted for each phase. Return to A was similar to baseline except that Samuel was being observed and tested on how well he performed after he had been shown how to role-play with eye contact and verbalizations. Two follow-ups were arranged and a total of 40 sessions were provided over an 8-week period.

Teaching intervention. At the beginning of each teaching session, the researcher first taught the child to use the strategy. The researcher said: "Samuel, when someone talks to you or when you talk to someone, you must remember to do three things. First, you have to *look* at the person's eyes. Second, you have to *think* of what to say. And third, you have to open your mouth and *talk*". Repeat the three key words *look*, *think*, and *talk* with actions (fingers pointing to the eyes, the head and the mouth as each word is being said). The researcher then repeated the strategy and asked the child to repeat it after her. Finally, the researcher asked the child: "Samuel, what must you remember to do when someone talks to you or when you talk to someone?" The child was expected to recall the strategy by listing the three activities.

The researcher proceeded to introduce the different roles with the accompanying hats, hats, toys, accessories and peripherals (e.g., "This is the postman's hat and here are some letters, parcels and stamps he would use". "A postman goes to your house to deliver letters and parcels", etc). The start of the activity is *prompted* by the researcher saying: "Let's play....." (e.g. "Let's play the postman") and "It's my turn".

The researcher modelled eye contact by looking into the child's eyes every time she talked to him and demanded eye contact verbally or non-verbally when he did not give eye contact when talking to her. The researcher modelled appropriate verbalizations by greeting him appropriately, demonstrating social behaviour, encouraging conversation and extending conversation during the role-play. The child is *greeted* appropriately by saying "Hello!", "Good morning postman", or just calling the child by name.

The researcher *demonstrated social behaviour* by providing frequent and varied examples of appropriate role-play and social skills. It included giving eye contact, turn taking, and initiating questions, answers and statements like "Can I help you?", "What would you like to eat?", "No, I don't have any strawberry ice-cream", "I have a hamburger, a sausage roll and pizza", "Here's your coffee", "Enjoy your lunch!", and "Thank you".

To *encourage conversation*, the researcher offered or withheld play objects while waiting for the child to give a verbal request or response. This was done instead of using gestures like reaching out to take the desired object on his own, pointing, nodding or shaking his head. If the child was quiet, the researcher kept talking and asking questions to guide and elicit a response or answer from the child in order to proceed with the role-play.

To *extend conversation*, the researcher expanded on the role that was being played. The topic of conversation centred around the play objects and role-play activities. The researcher would ask or say "Do you have a fever?", "Let me check your temperature", "You have a high fever", "This medicine is for your fever", "Take one teaspoon three times a day" and "Do you have a cough?".

Testing intervention. At the beginning of each 2-minute testing session, the researcher prompted the child by saying: "Let's play....." and "It's your turn", or "It's Samuel's turn" if he was role-playing with a peer. At the end of each session, the researcher would say "Thank you Samuel, you have finished playing the(postman)".

Phase A: baseline condition. The first trained peer was with Samuel for the testing period. The researcher prompted only at the start of each observation session and did not model the teaching strategy. Data was collected based on the researcher's observations on Samuel's eye contact and verbalizations during role-play.

At the beginning of the testing phase, the researcher introduced the training material and the roles to be played: "Here are some hats that people wear to do their work. This is a postman's hat, this is a doctor's hat and this is a waiter's hat" and "The postman will go to your house to deliver letters and parcels" and "The doctor will check you at the clinic when you are sick" and "The waiter will serve you food at the restaurant when you are hungry" and "These are things the postman has: letters, parcels and some stamps" and "These are the things the doctor has: stethoscope, thermometer, medicine....." and "These are the things that the waiter has: plate, cup, spoon, fork, knife, fruit, food, drinks.....". The trained peer was asked to play one of the roles first, then the participant would have his turn next. For example, "Wilson will play the postman first, then Samuel can also play the postman later". "Let's play the postman, Wilson, it's your turn". When the peer has finished, the researcher said "Thank you Wilson, for playing the postman". "Now, it's Samuel's turn to play the postman". "Are you all ready?.....okay". "Let's play the postman, Samuel, it's your turn". This order and turn taking was kept until the participant had completed the five sessions at baseline.

Phase B: child with researcher and feedback. During teaching, the researcher prompted and modelled the strategy as described in the teaching intervention. The researcher undertook role-play with the child to encourage appropriate use of eye contact and verbalizations to promote the development of social skills.

During the testing phase, the researcher responded in two ways: in the role played and in giving feedback. When responding in role, the researcher would answer the questions given by the child or direct questions at him to elicit a response. She would also look at him whenever she talked and kept the topic of conversation going for each 2-minute session. When responding by giving feedback, the researcher smiled, nodded, and gave verbal reinforcements such as "That was good looking" or "Good boy for looking at me" (for eye contact) and "That was good talking", "That was good asking", or "Good boy for answering my question" (for appropriate verbalizations). Feedback was necessary at the initial stage to guide Samuel in understanding what was expected of him and whether he was doing it correctly.

Phase C: child with researcher and no feedback. During the teaching phase, the researcher prompted and modelled as she did during Phase B. However, during testing period, the researcher responded in role by only giving appropriate eye contact and verbalizations and did not give any corrective feedback to Samuel.

Phase D: child with one peer. The same peer used in Phase A (baseline condition) was included during this period of teaching and testing. During teaching, the researcher still prompted and modelled. However, during testing, the researcher was not involved in the role-play which only took place between Samuel and his peer.

Phase E: child with two peers. This was basically the same as Phase D except that an extra peer was included for teaching and testing to form a small group to facilitate

interaction; and to simulate a closer resemblance to real-life situations. During teaching, the researcher continued to prompt and model. During testing, the researcher again was not involved in the role-play which only took place amongst the three children while Samuel was being tested.

Follow-up. The first follow-up was conducted two weeks after return to baseline. This was basically the same as baseline but with a few novel stimuli added for the role-play between Samuel and the first trained peer. The main reason for doing so was to observe if Samuel was able to apply the skills he was taught in giving appropriate verbalizations and eye contact while role-playing with these novel stimuli.

Follow-up - generalization. The second follow-up was conducted four weeks after the first follow-up. During the five sessions, observation data was collected while Samuel engaged in the same role-play activities including the novel stimuli with his sibling (an eight-year-old brother). The main reason for introducing his sibling as a peer was to observe if he could generalise the skills he had acquired to a different but familiar person.

Recording of data. The data were collected systematically. This involved recording the number of appropriate verbalizations and total length of eye contact from the videotapes onto data collection sheets as shown in Table 3 for all the test sessions for data analysis. For each of the three participants, the camera was focussed on the child to record any eye contact, verbalizations and behaviour exhibited during role-play. Recording the sessions on videotapes provided both visual and audio means for data collection which were used in the data analysis and inter-observer reliability measurement. It also allowed repeated viewings of the dependent variables for data accuracy.

Inter-observer reliability. Inter-observer reliability was calculated for 20% of the sessions, across all the phases including the follow-up for both dependent variables by measuring occurrences of eye contact (in seconds) and number of appropriate verbalizations. The therapist who has been working with Samuel measured and recorded the dependent variables through viewing the videotape. One session was chosen from each phase and each follow-up on a random basis (8 sessions out of 40). For the number of verbalizations, the percentage of agreement between the researcher and the individual observer was 88.9% and for eye contact it was 79.5%. The percentage of agreement was obtained by totalling up the number of verbalizations or seconds of eye contact recorded by the researcher, dividing it by the total number of verbalizations or seconds of eye contact recorded by the individual observer and multiplying it by 100.

Results

Verbalizations

The number of appropriate verbalizations given within two minutes of role-play is presented in Figure 2. During baseline, Samuel gave appropriate verbalizations at relatively low levels, averaging 3.2 verbalizations and a standard deviation of 1.19 over five sessions in Phase A. The length of verbalizations were generally short, usually no more than four words. For example, "Nothing inside", "What do you want?".

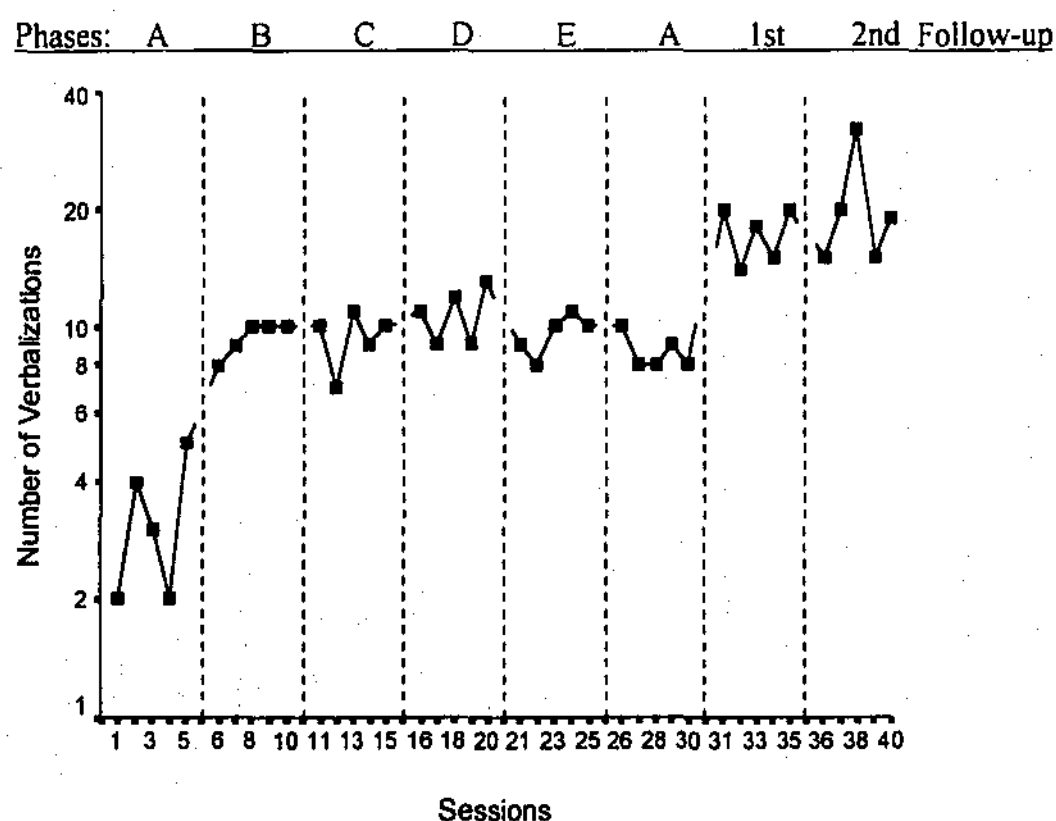


Figure 2. Number of appropriate verbalizations per 2-minute session.

In this research, semilogarithmic charts for displaying the graphs of the participants performance have been used. The charts reflect the rate of change rather than the amount of change and may more accurately reflect the effort involved in teaching and learning.

Some researchers have advocated for the use of semilogarithmic charts (Wolery, Bailey, & Sugai, 1988; Lindsley, 1964) as a precision teaching approach to applied behaviour analysis.

In the first session of the teaching intervention, the number of appropriate verbalizations rose from 5 to 8 and continued to increase steadily and stabilize with an average of 9.4 verbalizations and a standard deviation of 0.80 over five sessions in Phase B. There was a marked improvement in Samuel's question-asking and responding, which resulted in a higher performance level compared to baseline. Generally, his verbalizations were 3 to 6 words long and grammatically correct. The increase in verbalizations can be attributed to the researcher's teaching and feedback. The teaching sessions encouraged the child to answer and talk during the role play as well as to ask questions similar to those demonstrated by the researcher. Being a high-functioning autistic child with a good memory has also helped Samuel reciprocate similar question-asking and answering skills that were modelled during the role-play sessions. For the initial sessions during teaching intervention, he was observed to parrot the researcher's verbalizations more while learning to initiate question-asking during role-play. However, he was also able to use his own language to express his thoughts and answers well while role-playing with the researcher. As the number of intervention sessions increases, Samuel's tendency to emulate the researcher's verbalizations decreases.

The increase in performance was maintained for the first session of the second phase of the teaching intervention - Phase C. However, the number of verbalizations dropped for the second session from 10 to 7 but increased again for the third session to 11

verbalizations. On the whole, his verbalizations were 3 to 7 words long and spoken in the right context. The level of performance was maintained at an average of 9.4 verbalizations with a standard deviation of 1.36. The dip in the number of verbalizations during session two was due to the child's inappropriate behaviour. First, the child had the tendency to gaze quietly at his own reflection on a glass panel on a cupboard. Second, he was preoccupied with the toys and engaged in self-talk. There is a decrease in both question asking and responding for session two. This behaviour usually occurred when he was in the role of the mechanic where he would move to an open space near the cupboard with the glass panel to act out the part of repairing the car.

Samuel displayed relatively good verbalization skills with a trained peer in Phase D, averaging 10.8 verbalizations in his performance and a standard deviation of 1.60. The length of his verbalizations were longer compared to baseline. The number of words used ranged from 3 to 8 per verbalization and were grammatically correct and spoken in the right context. For example, "Here's your letter", "Do you want to drink ice lemon tea?".

With the introduction of a second trained peer, Samuel's level of performance over five role-play sessions in Phase E averaged 9.6 verbalizations with a standard deviation of 1.02. Although the average number of verbalizations dropped by 1.2, Samuel's overall performance in this phase demonstrated some maintenance and generalization of verbalization skills acquired by him in the previous phases. He was able to engage in question asking and responding with the second peer as he did with the first peer.

During a return to Phase A condition (i.e. no teaching or prompting by the researcher),

Samuel's level of performance averaged 8.6 verbalizations while engaging in five two-minute role-play sessions with the first peer. The standard deviation for the verbalization scores in this phase was 0.80. The levels of performance during the teaching and peer intervention sessions remained quite consistent throughout the phases B, C, D, E and Return to A. The average number of verbalizations were 9.4, 9.4, 10.8, 9.6 and 8.6 respectively for the phases. This indicates a marked improvement in Samuel's ability to verbalize appropriately compared to the average number of verbalizations of 3.2 at baseline.

During the first follow-up (two weeks later), the number of verbalizations observed increased substantially from an average of 8.6 verbalizations (during return to Phase A condition) to an average of 17.4 verbalizations. This is double the level of performance for Samuel after teaching and peer interventions and three times higher than the level of performance compared to baseline. Samuel's question asking and responding gained fluency and spontaneity as observed by the researcher and he performed well during the role play sessions.

During the second follow-up (four weeks later), the level of verbalizations remained high with an exceptionally great increase in the number of appropriate verbalizations during session three. This demonstrated some mastery of the question-asking and responding behaviour that was initially demonstrated by the researcher during the teaching phases (B and C). It has been observed that the majority of the sessions where Samuel spoke with greater frequency occurred when he was playing the role of a waiter. Although there was slightly more than a 100% increase in verbalizations during the two

follow-up sessions, the relatively wide variability shown in both follow-up sessions indicated some fluctuations in the child's performance. For example in the first follow-up, appropriate verbalizations were recorded at 20, 14, 18, 15 and 20 over the five 2-minute sessions; thus presenting an increasing and decreasing pattern in the child's performance. However, the verbalizations were still clearly above the B, C, D, and E phases.

The slopes of progress throughout the phases B, C, D, and E remained quite consistent with a slight ascending trend. This indicates a fairly slow but steady rate of responding for Samuel in giving appropriate verbalizations. The two distinctive increases in Samuel's slopes of progress can be seen from the comparison between Phase A and Phase B and well as between Return to Phase A and the first follow-up session. The possible reasons could be the introduction of the teaching intervention and the "internalization" of the skills taught after Samuel had completed 30 role-play sessions. It is reflective of the characteristics of children with autism, where once they have been provided with the routine repetitive strategy and practice to perform a skill, they will eventually master it.

The standard deviations of Samuel's verbalization scores were 1.19, 0.80, 1.36, 1.60, 1.02, 0.80 for baseline (Phase A), Phase B, C, D, E and Return to Phase A respectively. This indicates that most of his scores did not deviate much from the mean distribution because they generally fell within one or two standard deviations below or above the normal curve. The scores in Phases B and Return to A show the least variability while Phase D shows the most variability.

Eye contact

Figure 3 shows the number of seconds of eye contact given within 2-minutes of role-play. During baseline, Samuel's eye contact level was very low, averaging one second per session. He usually talked without looking at the person he was talking to. However, there was a tremendous increase in eye contact during the first session of the teaching intervention Phase B. This was due to the researcher's teaching and feedback whenever Samuel gave eye contact during role-play. The frequent and continuous question-asking and responding demonstrated by the researcher prompted the child to increase the frequency of his looking at people much more than he normally would without these reminders, cues or verbal reinforcements. The role-play activities and teaching materials were also new and interesting to Samuel who was eager to participate in the sessions. This aspect of stimulating an autistic child to "look" and pay attention to things and people around him has been used in various ways by other researchers to train the child to give eye contact or to lengthen their eye gaze.

The sudden increase in eye contact for the first session dropped in the second and third sessions during Phase B but picked up again for the fourth and fifth sessions. On average, 12.0 seconds of eye contact per 2-minute interval in Phase B were observed as compared to an average of 1.4 seconds of eye contact per 2-minute session in baseline. This showed a marked improvement in Samuel's eye contact during the researcher's teaching interventions.

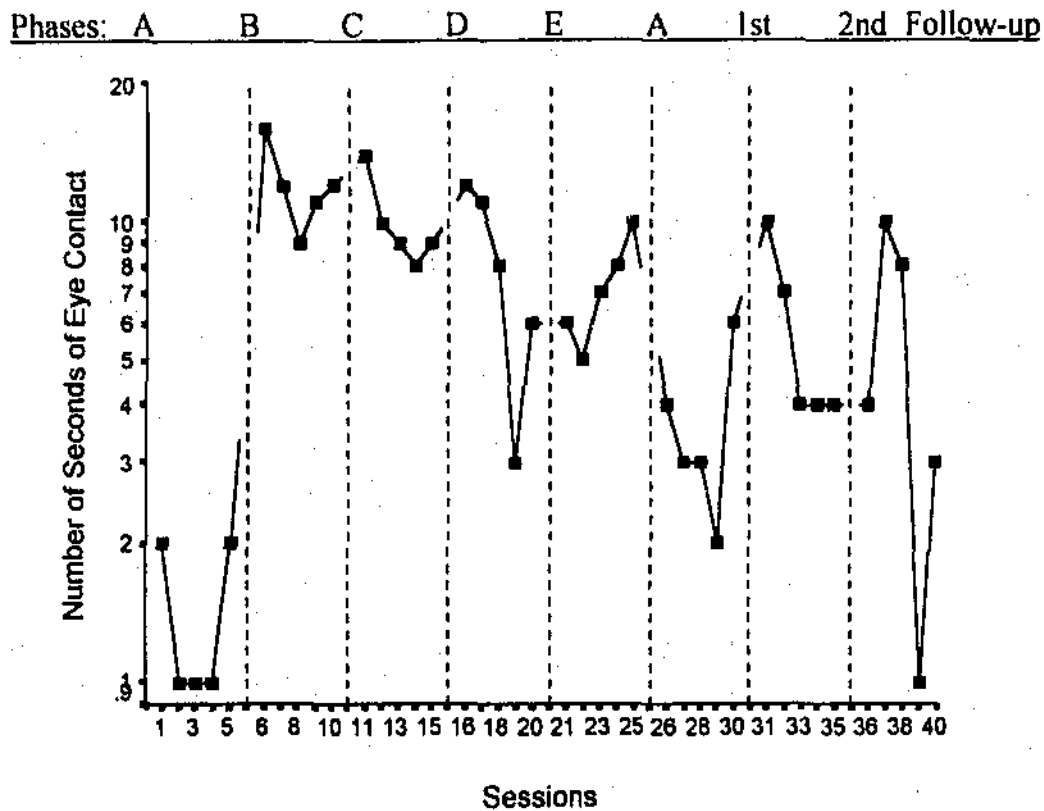


Figure 3. Number of seconds of appropriate eye contact per 2-minute session.

During the second teaching intervention, Phase C, the pattern of eye contact was quite similar to Phase B. It started with 14 seconds for the first session, tapering to nine seconds by the fifth session. On average, Samuel was able to give 10.0 seconds of eye contact per 2-minute interval, which is substantially higher than at baseline. During testing, the researcher did not give the child any feedback regarding his eye contact during this phase.

Samuel's level of performance for eye contact dropped to an average of 8.0 seconds of eye contact per 2-minute interval in Phase D during role-play with the first trained peer. The graph shows a sharp decrease in eye contact, especially in session four where Samuel's preoccupation with playing the toys caused him to forget to look at the person

he is talking to or playing with. The graph also shows that the level of eye contact does not necessarily correspond to the level of verbalizations. For example, the level of verbalizations may remain high or be on an increasing trend while the level of eye contact may drop or be on a decreasing trend. This was because Samuel was talking appropriately but without looking at his peer most of the time.

With the inclusion of a second trained peer in Phase E, the graph shows a slow and steady climb over the sessions with less variability. This could be attributed to an additional peer in the group whom Samuel had to pay attention to during the role-play. However, the average 7.2 seconds of eye contact is still less than Phases B and C where the researcher was present to motivate and direct Samuel in giving more eye contact.

During the return to baseline Phase A condition, Samuel's level of performance dropped lower to an average of 3.6 seconds of eye contact per session. This shows that although the level of verbalizations have increased considerably, the level of eye contact was only slightly better than baseline.

The first follow-up (two weeks later) and the second follow-up (four weeks later) showed similar patterns of performance, with an increase in seconds of eye contact initially in each phase before falling off. Both follow-ups averaged 5.0 seconds of eye contact per session. The fourth session of the second follow-up showed only one second of eye contact because of a novel stimulus with which the child was preoccupied. This behaviour of Samuel had been relatively consistent whenever a novel stimulus was present amongst the rest of the toys used in the role-play. For example, by adding a plaster to the doctor's medical kit, an orange to the waiter's food basket, or an inking

stamp to the postman's package.

The novel stimuli were included in the follow-up to maintain Samuel's interest. During the follow-up sessions, the researcher observed that the child's behaviour, verbalizations and eye contact were affected by the plaster and inking stamp, but not by the orange. It appeared that the orange, which is a more common object, was less interesting for him to explore than an inking stamp or a plaster, which he would normally not have the experience to use for himself or for others.

The standard deviation for Samuel's eye contact scores were 0.49, 2.28, 2.10, 3.29, 1.72, 1.36 and 2.4 for the Phases A, B, C, D, E, and Return to Phase A respectively. This indicates that most of his scores deviated greatly from the mean distribution and were generally at the extreme ends of the normal curve. This shows that Samuel's total length of eye contact given within a 2-minute session fluctuated quite a fair amount from the wide variability obtained. Overall, the results showed that there was a big increase in Samuel's appropriate verbalizations and even more at the follow-up, and less increase in his eye contact which was not maintained at the follow-up.

Discussion

Verbalization

Results of this research suggest that the strategy has been effective in teaching social behaviours (i.e. verbalizations and eye contact) and enhancing complex interactive behaviour (i.e. attention to people and situation) in this child with autism. The number of verbalizations during the teaching phases B and C were about triple the number of verbalizations recorded during baseline. The marked improvement in verbalizations from an average of 3.1 at baseline to an average of 17.0 in the first follow-up indicated that Samuel generally responded well to teaching and feedback, and the increase in verbalizations was not merely maintained but expanded. The length of his verbalizations were generally long, spoken fluently and appropriately. Each verbalization was between one to eight words (e.g., "Hello!", "What's wrong with your car?", "Do you want a glass of water?", "Did they steal anything else from your house?"). He performed well in his verbalizations for all the phases compared to baseline. He was able to use his own language about 70% of the time and also some of the language that the researcher and his peers used. Therefore, his verbalizations came across as rather natural and spontaneous except for some occasional inappropriate comments and some verbalizations made when he was out of his role. The enormous increase in verbalizations could be due to the teaching interventions and "internalization" of the skills after Samuel had completed the 40 role-play sessions. He seemed to remember and use the strategy to "think and talk" better than the skill to "look" during the sociodramatic play.

Eye contact

Results on the length of eye contact showed that Samuel made some improvement in his eye contact compared to baseline. The initial increase in eye contact acquired in the teaching phase - B gradually declined over the phases but improved during the two follow-up phases after a break of 2 weeks and 4 weeks respectively. He was observed to be more eager to participate in the role-play activities after a long break which might have led to the increase. However, the wide variability and decreasing trend in his eye contact give rise to the question of stability of the child's ability in maintaining eye contact. This could be due to several possible reasons. First, insufficient feedback given to Samuel regarding his eye contact during role-play. Perhaps corrective feedback from the researcher should have been prolonged for a few more sessions to allow him to practice giving the appropriate eye contact during interactive role-play. Based on the results, Samuel was able to give more eye contact when role-playing with the researcher in Phases B and C. This was largely due to more feedback given and the researcher's ability to re-direct his attention and interest through the conversations in the role-play activities. There were also more questions and responses presented with few pauses compared to the peer interventions in Phases D and E. This indicated a need for Samuel to be consistently reminded, given feedback and opportunities to look in order to improve the amount of time he gave eye contact during social interactions. It also meant that his eye contact level depended on the amount of eye contact other people gave him as well as requested of him in order for Samuel to learn to reciprocate that desirable social behaviour. The aspect of stimulating an autistic child to "look" and pay attention to

things and people around him has been used in various ways by other researchers to train the child to give eye contact or to lengthen their eye gaze (Kozloff, 1974, Tiegerman & Primavera, 1984). Second, familiarity and predictability with the questions, responses, activities, peer and materials used during role-play could have contributed to his behaviour of being able to give verbalizations without having to "look" or pay attention any more. Samuel was talking without looking and without waiting to see if his peers might respond to him differently. This is typical of the ritualistic and rote-learning behaviour inherent in children with autism (R. L. Koegel, Rincover & Egel, 1982). Third, preoccupation with a particular object or activity. His gaze and attention were fixed on a few selected toys items during some sessions while he played with or manipulated each item all by himself and sometimes engaged in self-talk.

Preoccupation with objects is one of the characteristics of autistic children (R. L. Koegel & L. K. Koegel, 1995) and this behaviour could have contributed to the low level or sudden decrease in eye contact in some of the sessions. The total immersion in an object or subject is often the main problem of autistic children who seem to have cut off social contact with people. It is also interrelated with their lack of awareness in the expressions and emotions given by people during verbal and non-verbal responses during social interaction and a lack of the need to observe and socialize with others.

Learning Behaviour

It was interesting to note that Samuel was more motivated during the training period when he was learning to do something new and less motivated to comply as he continued to engage in the same role-play activities as he went along with the other sessions in the

later phases with his peers. In short, he tended to tire of things quickly. Samuel was able to learn things very quickly because of his good memory and therefore tended to be more stimulated during the initial sessions while he was still in the learning phase. But after having learned what he was supposed to do or say in the role play, 'reactive inhibition' set in. This is Hull's (1884-1952) term for the hypothesized inhibitory tendency that builds up as a result of effortful responding. In other words, he did not bother to look at people or become aware of others once he had learnt what to do or knew what to do. This is a characteristic of Samuel that has been observed by the therapist, the teachers and his parents.

The effect of predictability and familiarity with the objects and role-play activities showed that although it contributed to Samuel's increase in learning the skills taught (because autistic children learn well through a set framework and routine), it also led to some increase in dominance in Samuel. In some sessions, Samuel was observed to be impatient, directive, insisting on his own way or his own answer and had some difficulty in being the recipient when it came to accepting a different answer or "No" as an answer. For example, he tended to ask questions very quickly and did not wait for his peer's response. If his peer responded with a different answer from what had been said before in the previous sessions, he may start correcting his peer and not respond to the new answer accordingly. He also tended to anticipate and predict the familiar questions, answers and role-play activities. On the positive side, it has helped him learn how to respond and verbalize in that particular social context. On the negative side, it has not helped him learn to be flexible when applying the skills he has learnt due to the complex

nature of social interactions. However, with continued opportunities of handling a different answer or a "No" answer as he continued to role play with his peers and sibling over the 40 sessions, his dominance and resistance to unpredictable answers decreased. This showed that a high-functioning child with autism was able to modify his social communicative behaviours during conversational interactions following training and repeated practice.

Novelty of materials

A few novel stimuli were intentionally added to the training material of toys and accessories in the follow-up sessions to offset the excessively repetitive routines in early training schedules. They were used to break the routine of the treatment program and observe if Samuel would take notice of them as new objects for role-play as well as whether the new objects would affect his eye contact in some way. What was observed were his immediate notice of the novel stimuli, his fixation on two of the items and his insistence on his own preference regardless of the peer's verbal response or facial expression. Therefore, there were times when he was able to ask questions appropriately but did not respond appropriately to the answers given. In one of the sessions, he made repeated requests to have the ink stamp and ink pad while the peer was using them in the role of a postman. When it was his turn to be the postman, he insisted on using the ink stamp and ink pad to produce a receipt for the peer when the peer had repeatedly said "No, I don't want a receipt". In another example, while playing doctor, Samuel again repeatedly asked the peer if there was any blood (from a wound or a cut) so that he could use the plaster (new object) on the peer. Again, when the peer replied with a "No"

answer, Samuel insisted with a "Yes, you have blood-blood" and proceeded to apply the plaster even though the peer kept saying "No" and tried to prevent him from applying it. All the while when he was handling these two novel stimuli, his eye contact was fixed on the object and not on the peers' eyes or faces even though he was talking on the subject. However, when he repeatedly requested the object from the peer, he did make eye contact. These observations suggest that it may be possible to use novel stimuli to teach Samuel and other autistic children about coping with environmental variation, to pay attention to his environment and people at all times by looking and making eye contact so as to respond with appropriate social skills to the situation in context. Introducing novel stimuli gradually can also be a way to capture and maintain their learning interest as well.

The main aim of this teaching intervention was to provide an autistic child with routines and strategies to train him to a high level of automaticity so that he could achieve fluency in response. At the same time it was intended to guide him in being aware of variations that may arise when they are trying to apply the skills they have learnt to real social contexts in life.

Change in role-play conditions

In one of the conditions (Phase E), a second trained peer was included in the role-play activities. Samuel seemed excited to have a second classmate participating in the activities. Each boy took turns to play a role of their choice. Samuel was able to take turns and responded in very much the same way as he did with the first trained peer. He was able to pay attention and look at his peers while they were playing about 50% of the time. The other 50% of the time he would just sit quietly and wait while focussing his

attention on the toys or certain parts and objects in the room. Sometimes, he would suddenly correct one of his peers if he thought they had not said something or may have said something different from what he thought was supposed to be said. Then, there would be a little argument amongst them which was very quickly settled or ignored. It was encouraging to note that Samuel did not withdraw himself from the small group and let the other two boys take over the interaction. He was observed to be eager in getting his turn to role-play. This could be due to his interest in the activities as well as the relatively short waiting time of two minutes of role-play per child. With the gradual introduction of trained peers in a small group session, it can create a more realistic setting for the child to learn how to interact socially through practice and observational learning (Shaw, 1981; Fink & Sandall, 1978; Doyle, Gast, Wolery, Ault & Farmer, 1990). This will lead to better generalization and maintenance performance when the child is put in an environment where there are also non-trained peers in a larger group setting (Chandler, Lubeck & Fowler, 1992; R. L. Koegel & L. K. Koegel, 1995).

Although Samuel was able to interact with the two peers, there were times when he was oblivious to the normal child's teasing and mischievous behaviour as displayed by the other two boys when they were talking and sharing jokes. He did turn and look at them, but did not join in or ask about what they were laughing or giggling about. He simply continued with his role-play in a similar manner to what he had been doing in the previous sessions. This may support the characteristics of an autistic child's inability to understand the finer aspects, subtlety and complexity of social interactions (The National Autistic Society, 1995).

Type of peer needed

While working with Samuel and his peers in this research, the researcher realized that a slightly older and more assertive peer would have been better for Samuel in directing more questions at him and varying the role-play activities. An older peer may also request more eye contact from Samuel who required the motivation to look at people instead of being dominant and sometimes ignoring others' requests or emotions. By being in control of the role-play, the older peer would also be better at making Samuel wait for his turn. The improvement in Samuel's performance through the use of a slightly older peer can be seen in the second follow-up where Samuel displayed fluency in his verbalizations, more patience and confidence in the role-play and even displayed some humour during some of the activities. He was able to tease his peer as well as laugh and giggle when something funny was said or done while playing. This positive behaviour and the ability to reciprocate emotions more naturally could be attributed to two factors: using an older peer who was more likely to be assertive and flexible than same-age peers in presenting possible ways of responding to better simulate real life situations of the roles they play, and using a sibling (his elder brother) whom Samuel has a good rapport with from the home environment. In this case, it was not possible to identify how much of the improvement was due to an older peer and how much was due to the rapport he had with his brother. However, as a result of the above observations, the researcher decided to use an older peer for the second and third child in the research.

CHAPTER 5

STUDY II

Introduction

Anthony (a pseudonym) was the second child involved in this research. Like the first child in Study I, Anthony is considered a high-functioning child with autism because of his normal intelligence and IQ score. However, many high-functioning children are typically quite ineffective socially. Like low-functioning children with autism, they often desire to be alone, adhere rigidly to structure and schedules, are disinterested in others (particularly peers), and persevere in focussing on irrelevant objects or topics (Kamps, Leonard, Vernon, Dugan, Delquadri, Gershon, Wade and Folk, 1992). Therefore, there is a need to help Anthony improve his social skills to interact with others successfully and function independently.

Anthony is a five-year-old boy who was diagnosed by child psychologists and therapists as having autistic characteristics that fit the DSM-IV classification of pervasive developmental disorder (American Psychiatric Association, 1994). Therapists observed that he was unable to remain on-seat and on-task for more than 10 minutes. He also tended to be upset and at times throw tantrums by whining and being off-tasks and off-seat when his requests (not associated with the sessions) are not met. If he is distressed, he may give way to screaming and shouting. Such characteristics whereby the child has difficulty in attending or being impulsive are typical of autistic children.

Anthony's parents are also concerned about certain behaviors. For example, he has to be the first to open the gate, he gets upset if he misses a certain segment of a game show, or

he insists on slotting in the train card. These manifestations of his behavior are common to autistic children who like to keep to a particular order and pattern in a routine and tend to get upset when the order is changed or the people involved in the usual activities are changed (Hoare, 1993). This has been related to the characteristics of rigidity and inflexibility inherent in them. Child psychologists used The Autism Behavior Checklist and the Leiter International Performance Scale (Leiter, 1948) to complete Anthony's formal assessments. He scored an IQ of 117 and his Autism Quotient on the Gilliam Autism Rating Scale (Gilliam, 1995) was 87. Teachers from his kindergarten classes have observed that Anthony rarely socializes with his classmates. He would normally play on his own or engage in parallel play. There is an impairment in his social skills. He does not initiate verbal communication or interaction and may not respond appropriately to initiations from others. From time to time he asks for "Mummy", or runs to the window.

Anthony is the only child in the family. His father works full-time while his mother works part-time. This arrangement allows Anthony's mother to bring him for kindergarten and special therapy classes to enhance his overall development as well as to spend more time with him. Some of the activities that the mother does with Anthony at home include playing SCRABBLE (board game), practising Chinese writing or playing on the computer. He usually plays with his cousin (8 years old) once a week. He is currently attending kindergarten classes in a regular setting at a local Child Care Centre during weekday mornings and attends an hour of therapy classes at a Special School every afternoon except weekends. There are plans for him to attend special classes with

extended time on a daily basis.

After 12 months in a child care centre and therapy sessions at a special school, Anthony has made some improvement in his attention span and ability to follow instructions. The kindergarten teachers and speech therapists have noted these improvements. He is now able to remain on-task for 30 minutes and has learnt to wait and complete his tasks. Stickers and choice of activity are used as reinforcers for good behavior and completion of work.

The therapist's goals for Anthony are classified into three categories – language and communication, pre-academic and cognitive skills, and behavior. While all three categories are important areas for Anthony's development, the main area of concern is his language and communication. The therapist has highlighted the need for Anthony to be able to talk about himself, his family, his home, his friends. He needs to work on asking and answering questions appropriately, and to use "What?", "Where?" and "Why?" questions.

Anthony's parents, teachers and therapists have also noticed the need to improve his ability to give eye contact. Therefore, Anthony has been taught to greet teachers, peers and parents with eye contact. However, he generally does not respond and attend by looking at people when they talk to him. He has difficulty in holding eye contact for more than a few seconds. He normally looks away before the person finishes talking.

Children with autism generally have poor language skills, poor eye-to-eye gaze, poor imaginative play and lack co-operative and reciprocal play (Hoare, 1993). Therefore, in this research, a suitable intervention program using role-play and peer intervention with

real objects for question asking and answering related to each situation or topic was implemented. The aim was to increase Anthony's appropriate verbalizations and eye contact to improve his language and social skills.

The methodology used for the intervention was based on a single-subject case-study which followed an A-B-C-D-A design. A was designated as baseline and B, C, D were the teaching intervention phases of the study. A trained peer one year older than Anthony was present to provide the sociodramatic play and interaction during baseline, Phase D, return to baseline and the follow-up. The decision to use an older peer was based on the findings discussed in Study I for the first participant. An informal observation session of a peer (similar in age) who faced difficulty in trying to role-play with Anthony also confirmed the decision to use an older peer for the interventions. Each teaching intervention session was conducted with a teach-test-teach-test format and all the sessions were recorded on video for data analysis. Data collected were based on the number of verbalizations and the total number of seconds of eye contact that Anthony exhibited within each 2-minute session. The results showed that Anthony's verbalizations improved tremendously while his eye contact improved slightly after the teaching interventions.

Method

Peer training

The participant in this study was a 5 year old boy named Anthony who was diagnosed as having autistic characteristics in his social behaviour. His partner Benny (pseudonym) is a six-year-old boy who was involved in Phases A and D and the follow-up. The peer is one year older than Anthony and attends the same child care centre. Although they were from different classes due to their age difference, Anthony knew who he was because their classes were physically adjacent to one another and arranged in an open concept style. The peer was chosen on the basis of his social competence (ability to verbalize and hold conversations), maturity (confidence in social skills) and willingness to participate.

The peer was given one training session prior to the first intervention session of each phase. He was shown how to play the different roles with the respective training material. The same teaching intervention was used to teach the peer. The researcher taught the strategy and modelled each role before asking the peer to emulate the activities. Instructions were also given to help the peer guide the participant in the role-play.

The researcher said to the peer: "Benny, if Anthony keeps quiet, you must keep talking to him or use the toys to get his attention so that he will ask you a question or give you an answer". He was also told "If Anthony does not look at you, you must make him look at you by calling his name, looking at him or using the toys to get his attention so that he will look at you".

Setting and training material

Training and teaching intervention sessions for Phases B and C took place at the special school in the afternoon during regular school days. Baseline observations and peer interventions for Phases D, return to A and follow-up took place at the child care centre whenever the other class children were having their outdoor play in the morning. The training room was set up with a child-size table, two stools, and another table for placing the training materials. A similar set up was enacted at one corner of the classroom in the child care centre because they did not have a separate room to carry out the sessions. It was necessary to use two similar settings because it was difficult to arrange for the peer to be present at the special school.

Training material included toys of various kinds: hats belonging to different occupations (e.g. postman, waiter and doctor), accessories and peripherals (e.g., parcels, letters, stamps, cards, basket of fruit and food items, crockery set, tea and coffee set, eating utensils, medical kit with stethoscope, thermometer, medicine bottles, etc.).

A video recorder was used to tape the baseline observations, teaching sessions, testing sessions and the follow-up. A cassette recorder was also used as a backup and accuracy check.

Design

The research study used an A-B-C-D-A design and included a follow-up with five 2-minute sessions. A was the baseline, and B, C, D, were the various teaching interventions and conditions. The independent variables or conditions which Anthony was required to interact with others were the same as those listed in

Table 2. The two dependent variables were the number of appropriate verbalizations made by Anthony, and the total length of time (in seconds) during which Anthony gave eye contact when interacting with his peer within each 2-minute session.

Procedure

Phase A was the baseline where the researcher observed and recorded data for five 2-minute sessions of Anthony's role play. Phases B, C and D were conducted with a teach-test-teach-test format that consisted of two-minutes teaching and two-minutes testing. Five sessions were conducted for each phase. Return to Phase A was similar to baseline except that Anthony was being observed and tested on how well he performed after he had been shown how to role-play with eye contact and verbalizations with his peer after the teaching interventions. There was a follow-up on Anthony's performance and a total of 30 sessions were conducted for Anthony over 5 weeks.

Teaching intervention. At the beginning of each 2-minute *teaching* session, the researcher first taught the child to use the strategy. The researcher said: "Anthony, when someone talks to you or when you talk to someone, you must remember to do three things. First, you must *look* at the person's eyes. Second, you must *think* of what to say. And third, you must open your mouth and *talk*". Repeat the three key words *look*, *think*, and *talk* with actions (fingers pointing to the eyes, the head and the mouth as each word is being said). The researcher then repeated the strategy and asked the child to repeat it after her. Finally, the researcher will ask the child: "Anthony, what must you remember to do when someone talks to you or when you talk to someone?" The child will be expected to recall the strategy by listing the three things he has to do.

The researcher proceeded to introduce the different roles that were going to be role-played with the accompanying hats, toys, accessories and peripherals (e.g. "This is the postman's hat and here are some letters, parcels and stamps he would use." "A postman goes to your house to deliver letters and parcels", etc.). The start of the activity is *prompted* by the researcher saying: "Let's play....." (e.g. "Let's play the postman") and "It's my turn". The researcher modelled eye contact by looking at the child's eyes every time she talked to him and demanded eye contact verbally or non-verbally when he did not give eye contact when he was talking to her. The researcher modelled appropriate verbalizations greeting him appropriately, demonstrating social behaviour, encouraging conversation and extending conversation during the role-play. The child is *greeted appropriately* by saying "Hello!", "Good morning postman", or just by calling the child by name.

The researcher *demonstrated social behaviour* by providing frequent and varied examples of appropriate role-play and social skills. It included giving eye contact, turn taking, and initiating questions, answers and statements like "Can I help you?", "What would you like to eat?", "No, I don't have any strawberry ice-cream", "I have a hamburger, a sausage roll and pizza", "Here's your coffee", "Enjoy your lunch!", "Thank you", etc.)

To *encourage conversation*, the researcher offered or withheld play objects while waiting for the child to give a verbal request or response. This was done instead of using gestures like reaching out to take the desired object on his own, pointing, nodding or shaking his head. If the child was quiet, the researcher would keep talking and asking

questions to guide and elicit a response or answer from the child in order to proceed with the role-play.

To *extend conversation*, the researcher expanded on the situation and role that was being played. The topic of conversation centred around the play objects and role-play activities. The researcher would ask or say “Do you have a fever?”, “Let me check your temperature”, “You have a high fever”, “This medicine is for your fever”, “Take one teaspoon three times a day”, “Do you have a cough?”, etc.)

Testing intervention. At the beginning of each 2-minute *testing* session, the researcher *prompted* the child by saying: “Let’s play.....” and “It’s your turn” or “It’s Anthony’s turn” if he was role-playing with a peer. At the end of each session, the researcher would say “Thank you Anthony, you have finished playing the (postman) ”.

Phase A: baseline condition. The trained peer remained with Anthony for the testing period. The researcher *only prompted* the start of each observation session and *did not model* the teaching strategy. Data was collected based on the researcher’s observations on Anthony’s eye contact and verbalizations.

At the beginning of the *testing* phase, the researcher introduced the training material and the roles to be played to the boys: “Here are some hats that people wear to do their work. This is a postman’s hat, this is a doctor’s hat and this is a waiter’s hat”. “The postman will go to your house to deliver letters and parcels”, “The doctor will check you at the clinic when you are sick” and “The waiter will serve you food at the restaurant when you are hungry”. “These are the things the postman has: letters, parcels and some stamps”, “These are the things the doctor has: stethoscope, thermometer, medicine,

.....” and “These are the things that the waiter has: plate, cup, spoon, fork, knife, fruit, food, drinks,”. The trained peer was asked to play one of the roles first, then the participant would have his turn next. For example, “Benny will play the postman first, then Anthony can also play the postman later”. “Let’s play the postman, Benny, it’s your turn”. When the peer has finished, the researcher will say “Thank you Benny, for playing the postman”. “Now, it’s Anthony’s turn to play the postman”. “Are you all ready? ...okay”. “Let’s play the postman, Anthony, it’s your turn”. This order and turn taking was kept until the participant had completed the five sessions at baseline.

Phase B: child with researcher and feedback. During the *teaching* phase, the researcher *prompted and modelled* the strategy as described in the teaching intervention as well as carried out the role-play with the child to encourage appropriate use of eye contact and verbalizations to promote the development of social skills.

During the *testing* phase. The researcher responded in two ways: in the role she played and also by giving feedback. When responding in role, the researcher would answer the questions given by the child or direct questions at him to elicit a response. She would also look at him whenever she talked and kept the topic of conversation going for each 2-minute session. When responding by giving feedback, the researcher would give smiles, nods and verbal reinforcements such as “That was good looking” or “Good boy for looking at me” (for eye contact) and “That was good talking”, “That was good asking”, or “Good boy for answering my question” (for appropriate verbalizations), etc. during the role-play. Feedback was necessary at the initial stage to guide Anthony in understanding what was expected of him and when he was doing it correctly.

Phase C: child with researcher and no feedback. During the *teaching* phase, the researcher *prompted and modelled* as she did during Phase B. However, during the *testing* phase, the researcher only responded in role by giving appropriate eye contact and verbalizations and did not give any corrective feedback to Anthony.

Phase D: child with peer. The same peer used in Phase A (baseline condition) was included during this period of teaching and testing. During the *teaching* phase, the researcher still *prompted and modelled*. However, during the *testing* phase, the researcher was not involved in the role-play which only took place between Anthony and his peer.

Follow-up. The follow-up was conducted one week after return to baseline. Basically, the follow-up was the same as baseline but included a few novel toys added to the role-play (e.g., a plaster in the doctor's medical kit, an orange in the waiter's food basket, and an inking stamp in the postman's package). The main reason for doing so was to observe if Anthony was able to generalize the skills he was taught, that is, giving appropriate verbalizations and eye contact while role-playing with these novel stimuli. The novel toys were also provided to lend some variation to the role-play materials and prevent monotony from setting in. During the five sessions, observations and data were collected while Anthony engaged in the same role-play activities with the trained peer again.

Recording of data. Data were collected systematically. This involved reviewing and recording the number of appropriate verbalizations and total length of eye contact from videotapes onto data collection sheets as shown in Table 3 for all the test sessions for data analysis. The video camera was focussed on the participant throughout each 2-minute

recording to fully capture all his verbal and non-verbal responses.

Inter-observer reliability. Inter-observer reliability was calculated for 20% of the sessions, across all the phases including the follow-up for both dependent variables by measuring the occurrences of eye contact (in seconds) and number of appropriate verbalizations. The psychologist who has been working with Anthony measured and recorded the dependent variables through viewing the videotape. One session was chosen from each phase and follow-up on a random basis (6 sessions out of 30). For the number of verbalizations, the percentage of agreement between the researcher and the individual observer was 78.6% and for eye contact it was 71.8%. The percentage of agreement was obtained by totalling up the number of verbalizations or seconds of eye contact recorded by the researcher, dividing it by the total number of verbalizations or seconds of eye contact recorded by the individual observer and multiplying it by 100.

Results

Verbalizations

The number of appropriate verbalizations given within two minutes of role-play per session is presented in Figure 4. During baseline (Phase A), Anthony gave very few appropriate verbalizations, the average number of verbalizations measured was 2.4 over five sessions and the standard deviation of his scores was 1.04. His verbalizations were usually 1 or 2 syllables, like "open", "four", "Yes", "bye-bye".

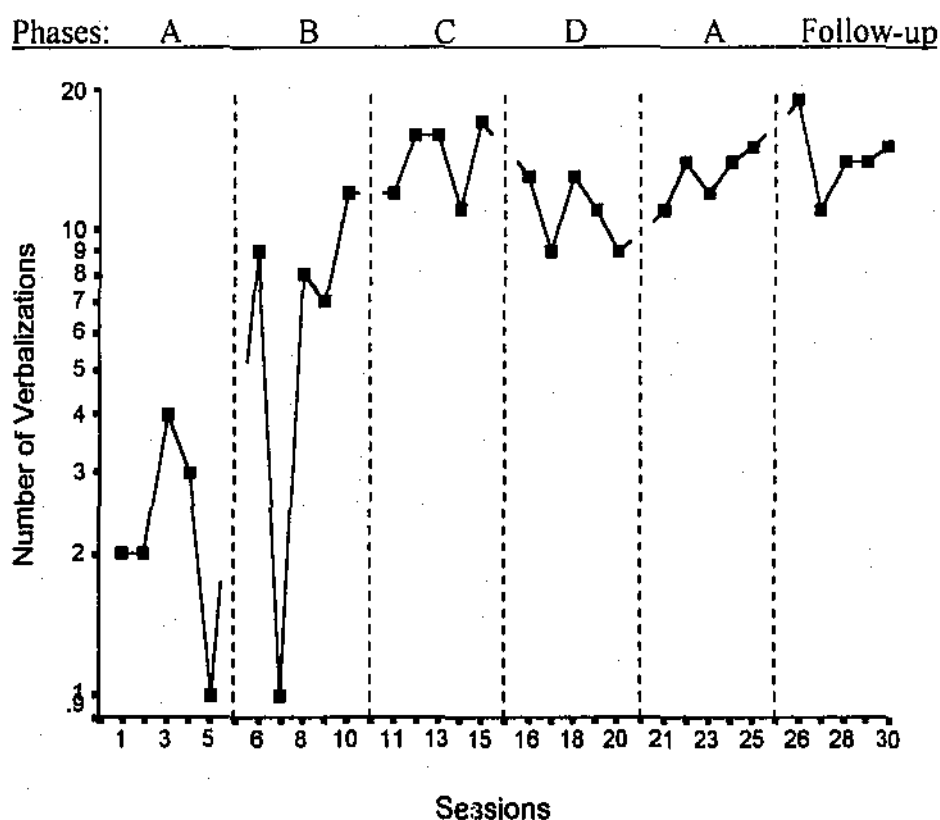


Figure 4. Number of appropriate verbalizations per 2-minute session.

In this research, semilogarithmic charts for displaying the graphs of the participants performance have been used. The charts reflect the rate of change rather than the amount

of change and may more accurately reflect the effort involved in teaching and learning. Some researchers have advocated for the use of semilogarithmic charts (Wolery, Bailey, & Sugai, 1988; Lindsley, 1964) as a precision teaching approach to applied behaviour analysis.

After the researcher's first teaching intervention in Phase B, Anthony's average number of appropriate verbalizations tripled from 2.4 to 7.4. Verbalizations increased in length to three or four syllables, like "check your eyes", "have you finished eating?". There was a big improvement from the last session in baseline of 1 appropriate verbalization to 9 appropriate verbalizations in the first session of Phase B (teaching intervention with feedback).

The second session saw a sharp dip in his verbalizations, but a big increase in eye contact. This resulted in a standard deviation of 3.61 which showed an extreme score with high variability. He spent one minute looking and handling the toys in the medical kit and occasionally looking at the researcher without talking. Then he only made one appropriate verbalization – "check your eyes" while playing the role of the doctor, after which he spent the remaining minute looking into the researcher's eyes and examining them in detail. He did not ask any more questions or give any verbalizations until the researcher gave cues verbally while role-playing, like "thank you" and "bye-bye".

His preoccupation with objects or a fixation on a particular activity is a distinct characteristic of autistic children. In this case, the materials may have been something new to him that he was curious to handle and explore. He could also be trying to imitate what the researcher did or what doctors do but was not able to shift away from that single

activity. Detail and topic shift is present in a subgroup of verbal children with autism. Individuals who have this difficulty often adhere to their favorite subject and show perseverance without actually being able to discuss or explore new angles on the subject. The total number of appropriate verbalizations for the third session in Phase B improved from 1 (in the second session) to 8. It increased to 12 verbalizations in the fifth session.

In Phase C (teaching intervention without feedback), Anthony's performance was very good, with an average of 14.4 appropriate verbalizations. However, the standard deviation for his verbalization scores was 2.42, which indicates a wide variability in his performance. His length of verbalizations increased further to a maximum of 5 syllables, like "Oh! I'm very hungry", "Yes, some more coffee", "I take the wrong spoon", "Do you have chocolate ice-cream?". This showed an improvement in his verbalizations compared to only 1 or 2 syllables at baseline.

In Phase D, Anthony demonstrated improvement in question-asking and talking skills. He gave 11.0 appropriate verbalizations on the average and the standard deviation of his scores showed less variability at 1.79. His question asking was done in a natural and consistent pace and he kept on-task throughout each 2-minute session while role-playing with his peer. Some questions and verbalizations included "You want lotion?", "This is Panadol", "Once morning, once afternoon, once at night", "You want some stamps?", "How many?", "No more already", "The shop is going to close" .

During the return to Phase A condition (i.e. no teaching or prompting by researcher), Anthony's level of performance averaged 13.2 verbalizations compared to 2.4 at

baseline. The graph showed an increasing trend for this phase as indicated by the three successive data points in the third, fourth and fifth sessions. It provides a distinctly positive direction in the child's verbalization skills. The levels of performance during the teaching and peer intervention sessions were consistently high compared to baseline. The average number of verbalizations were 7.4, 14.4, 11.0 and 13.2 for the phases B, C, D and return to A respectively. These indicate a marked improvement in Anthony's ability to ask questions, answer and talk appropriately in the various social contexts.

During the first follow-up (one week later), the number of verbalizations observed increased further from an average of 13.2 verbalizations (during return to Phase A Condition) to an average of 14.6 verbalizations. This is in line with the increasing trend as observed from the previous sessions in Phase D. Although there was a decrease in verbalizations in Session 2 of the follow-up, Anthony was still able to give 11 appropriate verbalizations within 2 minutes while playing the role of a doctor. He maintained his performance level at 14 verbalizations for the third and fourth sessions and increased it to 15 appropriate verbalizations for the fifth session.

The slope of progress for Phase B showed a sharp increase in the trend line during teaching intervention while the slope of progress for Phase C showed a consistently high level as indicated by the line of central tendency (the mean or median of the data points in the phase). Phase D and follow-up show a slight decrease in the slope of progress due to the drop in verbalizations in Session 2 for both phases. However, the level of performance or central tendency line remained high.

The standard deviation of Anthony's verbalization scores were 1.04, 3.61, 2.42, 1.79,

1.47 and 2.58 for Phases A, B, C, D, return to A and follow-up respectively. There was less variability during baseline because his scores in all the 5 sessions were rather low. Phases B, C and Follow-up showed a wide variability in Anthony's scores because they were more than two standard deviations away from the mean distribution of the normal curve. That means the scores tend to occur at the extreme ends of the bell curve indicating a wide range between the highest and lowest scores. There are two possible reasons that could have contributed to the variability in the scores. First, Phase B was the initial intervention where Anthony was introduced the teaching strategy to 'Look', 'Think' and 'Talk'. He was still in the learning process of trying to verbalize and give eye contact at the same time as taught and demonstrated by the researcher. Sometimes, he could do it better and at other times, he either could not or had not quite learnt the strategy yet. Second, his preoccupation with the objects or an activity could have affected some of his scores and caused the fluctuations. The scores for Phases D and the return to Phase A indicate less variability as they fell within one to two standard deviations. This means that there are lesser fluctuations in the scores, which in turn would reflect more accurately Anthony's verbalization performance at that stage. For these two phases, Anthony was observed to participate more in the role-play and he could ask and answer questions quite frequently and more spontaneously.

Eye Contact

Figure 5 shows the number of seconds of eye contact given within two minutes of role-play. During baseline, Anthony's eye contact level was low and showed a decreasing trend. He averaged 3.2 seconds over 5 sessions. He usually talked without

looking at the person he was talking to which is typical of children with autistic characteristics. Anthony showed an improvement in eye contact during the first and second sessions of the teaching intervention in Phase B. The total length of eye contact given increased from 2 seconds (lowest in baseline) to 10 seconds (highest in all the phases), and the average length of eye contact given improved from 3.2 seconds (baseline) to 6.2 seconds. For the first session, this could be attributed to the researcher's teaching and feedback that demanded more eye contact from Anthony which motivated him to look and attend to the researcher more than he would normally do. For the second session, Anthony was observed to be preoccupied with a particular activity (checking eyes) that contributed to the increase in eye contact. The frequent and continuous question asking and responding demonstrated by the researcher also prompted the autistic child to increase the frequency of looking at people in their eyes.

His total length of eye contact in Session 3 of Phase B dropped to 4 seconds, even though he emitted 8 appropriate verbalizations during this period. He was playing the role of a postman and the eye contact he gave was when he looked and said "Ding-dong" (imitating the doorbell), "Hello", "Thank you" and "Bye-bye". This is considered appropriate, however, he did not look at the researcher consistently when he was giving other verbalizations like "Yes", "20 cents", "five stamps". His eye contact improved again in Session 4 to 7 seconds. He was looking and checking the eyes of the 'patient' (researcher) for a good 5 seconds while playing the doctor. His ability to hold the eye gaze for 5 seconds and then move on with the role play indicates an improvement in his ability to shift topic and not to be too preoccupied with a single

activity like focusing on ‘checking eyes’ as mentioned previously. The other 2 seconds of eye contact was given when he said “Okay” and “For cough”.

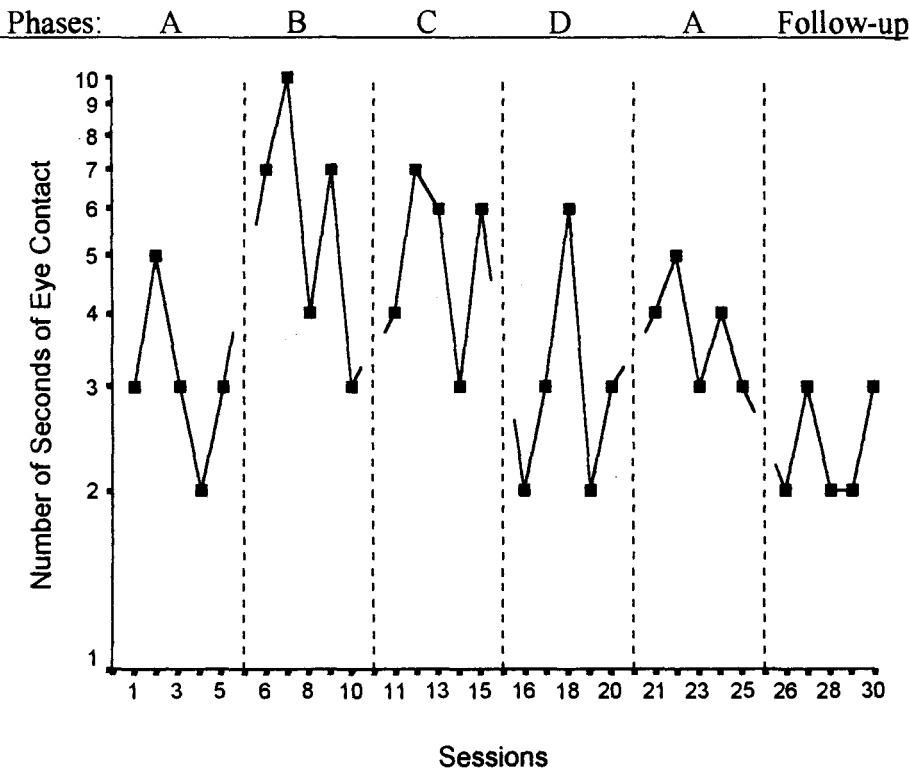


Figure 5. Number of seconds of appropriate eye contact per 2-minute session.

The improvement in topic shift did not necessarily lead to less preoccupation with objects for Anthony. An increase in appropriate verbalizations can be present with a decrease in eye contact as shown in Session 5 of Phase B. This is the reverse of Anthony’s behaviour earlier on in Session 2 where a decrease in verbalizations was present with an increase in eye contact. One possible reason could be due to his preoccupation with playing with the toys used in his role as the waiter. The researcher observed him to be engrossed in handling the toys and giving it to the researcher as

requested or on his own but without giving eye contact. The researcher gave verbal feedback like “Good looking at teacher Ping Ping” when Anthony gave eye contact on two occasions while asking “Have you finished eating?” and saying “Bye-bye”.

In Phase C, the average length of eye contact given by Anthony in a 2-minute interval was 5.2 seconds. He performed well for both his verbalizations and eye contact in this phase because he showed spontaneity and on-task behaviour. Both of these behaviours were also part of the goals set by the therapist for Anthony.

Anthony’s total length of eye contact dropped to an average of 3.2 seconds in Phase D (role-play with peer intervention). He was observed not to look at his peer while giving the appropriate verbalizations during the role-play and the length of eye contact given reverted back to baseline. He was talking without paying attention to his peer’s expression and responses. Autistic children have difficulty in tuning in to nonverbal communication and sometimes verbal communication because they generally do not pay attention to people’s responses and feelings.

In the return to Phase A (without teaching or prompting), Anthony’s eye contact showed a slight improvement by increasing from 3 to 5 seconds within a 2-minute interval. However, by the end of the fifth session, his total length of eye contact measured gradually returned to 3 seconds again. Anthony’s average length of eye contact for this phase was 3.8 seconds.

The follow-up was conducted one week after the return to Phase A. Although he continued to perform well for his verbalizations, his eye contact did not show any more improvement. Anthony consistently gave only 2 or 3 seconds of eye contact for each

2-minute role-play session with his peer. The average length of eye contact in the follow-up was 2.4 seconds. The observation made by the researcher regarding Anthony's low level of eye contact was the same as what was observed in Phase D – he was talking and playing appropriately but without looking most of the time.

In most phases (from baseline to follow-up), the slopes of progress show a decreasing trend in eye contact. The two phases that show consistency and perhaps Anthony's level of ability at this stage are Phase D and the follow-up, where the slopes of progress are horizontal and total length of eye contact is maintained at about 3 seconds within a 2-minute session.

The standard deviation for Anthony's eye contact scores were 0.98, 2.48, 1.47, 1.47, 0.75, and 0.49 for Phases A, B, C, D, return to A and Follow-up respectively. Most of the scores did not fluctuate very much throughout the phases except Phase B (first teaching intervention). There was more variability in Phase B because the scores were more than two standard deviations away from the mean distribution of the normal curve. There were three high and two low data points measured in Phase B for his total length of eye contact over five 2-minute sessions. The three higher data points (7, 10 and 7 seconds) reflect better success in invoking and demanding more eye contact from Anthony. However, the increase in the total amount of time that he was able to look at the researcher or his peer while verbalizing and playing gradually tapered off and maintained at about 3 seconds of eye contact per 2-minute session. His performance shows that his eye contact is still weak and has reverted somewhat near to baseline condition.

Discussion

Verbalization

The results of this research suggest that the teaching strategy and interventions aimed at trying to increase an autistic child's verbalizations have been effective and successful in enhancing his verbal language and social skills. The graph (Figure 4) showing Anthony's appropriate verbalizations indicates a strong increasing trend with some maintenance. The average number of appropriate verbalizations measured improved tremendously from 2.4 at baseline to 14.6 in the follow-up. Anthony's marked increase in verbalizations shows that he responded well to the teaching interventions and was able to maintain his performance at a satisfactorily high level. The length of his verbalizations increased from a maximum of two words at baseline to a maximum of six words at the end of the intervention (e.g., "You want stamps?", "Have you finish eating?", "This one is for your cough"). At times, he was able to use his own language and experience during question asking and responding while engaging in the pretend play. Some of the verbalizations include "I think it all spill, I think I pour again", "Open your mouth... the mouth very red, you have sore throat", "This is Panadol, for fever..." and so forth. From these observations, Anthony demonstrated his ability to recall and apply his own language and past experiences to another similar situation in this research (Sugden, 1989; Charlop & Trasowech, 1991; Goldstein & Cisar, 1992). This shows that an autistic child can be taught to expand his language and thinking skills laterally through a teaching strategy like "Look, Think and Talk" with related role-play activities that are fun and meaningful to them (Thorp, Stahmer & Schreibman, 1995). It is necessary for children

with autism to have regular interventions that are enjoyable and easily carried out to help them generalize the skills they have learnt. This will assist them in acquiring the social skills to cater to their everyday needs in life as well as to function harmoniously with others (Lerner, 1993). After the follow-up, Anthony's mother has reported an improvement in the frequency of his speech and verbalizations in communicating with his family members as well as with other people. He was also observed to answer more appropriately and to ask more questions.

Eye contact

The results for Anthony's eye contact were not as encouraging as his verbalizations. On the whole, the strategy of teaching him to "Look, Think and Talk" in the interventions did not bring about much change in the total length of eye contact he was able to give, the average total length of eye contact was 3.2 seconds at baseline and 3.8 seconds for return to baseline. He was able to give eye contact when asked to recall the steps in the strategy verbally at the beginning of each session, and able to look at the researcher and say "I must look at people's eyes", "I must think of what to say" and "I must open my mouth and speak". However, he was probably recalling the strategy by rote and through memory as most autistic children often do but have not internalized the process since he did not fully put it into practice. Initially, there was some improvement during the teaching phases and in some of the sessions when he role played with his peer, but his tendency of not looking at the person when he talked persisted through most of the later sessions. Although Anthony's level of eye contact was low, his level of verbalizations were high at the same time. He was observed to be talking without

looking and talking in a continuous manner without pausing to look or to wait for a request or response from his peer. That is, he was able to participate actively in the role-play but he seldom looked or forgot to look at his peer either when he was talking or when his peer was talking. There are some possible reasons for his lack of eye contact in this research which have been categorized under teaching intervention, stimulus materials, and emotional behaviour.

Teaching intervention

The five sessions conducted during the teaching intervention with feedback in Phase B may be too few or insufficient to bring about a change in his basic tendency of “not looking” or “not attending”. It may also indicate a need to modify the method of instruction based on response prompting strategies. This research used a combination of response prompting strategies, the most-to-least prompts procedure and the naturalistic teaching procedures. The researcher intended to use a procedure which provided prompts to teach eye contact to the child while at the same time would not cause too much interruption to the natural way in which role-playing normally takes place. The most-to-least prompts procedure, also known as the decreasing assistance procedure (Wolery, Ault, Doyle, 1992) was used to progressively fade the teacher’s assistance from the point of the most amount of help needed to ensure correct responses to the point of the student’s independent performance of a target behaviour (e.g., with teacher and feedback, with teacher and no feedback, without teacher and without feedback). The naturalistic teaching procedures, also known as incidental teaching procedure (Hart & Risley, 1975) was used to increase communication or language skills through interactions

between the child and the researcher or peer during the role-play (e.g., "I don't have orange, how about banana?", "Egg in the porridge, also can!").

The researcher first modelled prompts and gave corrective feedback to encourage eye contact from the child during role-play. This supports the strategic expert and novice approach to teaching to increase a desired behaviour or skill by providing a scaffold to cue and guide the child (Brown & Campione, 1986). The teaching instruction needs to be modified by including more verbal prompts regularly when teaching and interacting with Anthony during role play. Simply modelling eye contact and giving praises were obviously not enough for Anthony to learn the skill. More verbal prompting and feedback may be necessary to teach Anthony learn when to look at people and give appropriate eye contact. He may also require additional sessions with verbal prompts to practice the skill in order to gain some consistency and mastery before role-playing with his peer without assistance.

Another possible modification to the method of instruction may be to focus on teaching Anthony the eye contact skill first. While the teaching strategy was intended to teach him to look, think and verbalize during question asking or responding, the "looking" aspect was perhaps not clear, specific or focussed enough for him to learn that skill since he was taught to do three things concurrently when he was talking or when someone was talking to him. He was able to perform the "thinking" and "talking" skills better than the "looking" skill as shown from the results and graphs. It was possible that, by concentrating on what to say and verbalizing what he wanted to say, he forgot or could not give appropriate eye contact at the same time.

Stimulus materials

There were many toys used to accompany each role Anthony played to provide him with the variation and motivation to play and verbalize. The various toys may have contributed to the increase in the number of verbalizations he was able to make, but his eye contact could have been adversely affected. That is, he could have been so busily involved with looking at the objects or distracted by the objects that he lost eye contact with the person he was talking to. Therefore, while the toys provided the stimulus for play and interaction, they could also be providing the distraction that autistic children are often associated with due to their short attention span and lack of concentration. Being preoccupied with an object or activity is also one of the characteristics of autism (R. L. Koegel & L. K. Koegel, 1995).

Sociodramatic play

Anthony's ability to play the different roles as well as his ability to switch roles easily indicated an improvement in social interaction skills although his eye contact level was quite low. He could carry out the various activities involved in the role-play either through imitating the researcher and his peer or through using his own initiative in expressing his verbalizations and interpretation of play. Some of the observations made included his suggestion to his peer to "press the button" on the thermometer when taking and reading his temperature at the doctor's clinic. Instead of saying "sausage roll" like the researcher and his peer, Anthony also changed it appropriately to "hot dog roll". From his improved ability to role-play and interact, there is a likelihood that his ability to communicate and socialize has been indirectly increased.

Emotional behaviour

During some of the training sessions, Anthony displayed emotional difficulties and gave way to tears. Under such circumstances, it was not conducive to continue with the role-play because he was reluctant and visibly upset. This behavior was observed during the first attempt to observe him at baseline with a peer of the same age and the initial attempt during the teaching intervention. He was observed to lack a sense of security and confidence by repeatedly saying "Mummy will come" and "I want to go home". The first peer was later changed to an older peer to provide more effective role-modelling and the researcher tried to establish further rapport before collecting fresh data based on Anthony's role-play with the older peer.

Anthony's display of emotional difficulties could be a manifestation of some stress that he was experiencing while undergoing the training interventions and observations which he was not able to express verbally. This behaviour recurred again at the beginning of Phase D (role-play with peer after teaching intervention). Anthony hardly spoke while trying to role-play and he started to display emotional upset in a quiet manner as well as kept turning his face towards the windows. After talking to him and trying to carry out the role-play sessions for about 15 minutes without much success in terms of eye contact or verbalizations, the researcher felt it was necessary to stop and re-arrange another day to conduct the sessions again to prevent further upset to the child.

There were four possibilities that could have triggered the emotional display in Anthony. First, there was a change in setting, from the training room used in Phases B and C for the teaching interventions to a corner in the child care centre (similar to

baseline) where Anthony and his peer are attending kindergarten classes. The physical change in location could have disrupted his sense of familiarity and security. Second, the physical environment was not conducive because it was not an enclosed room and therefore there was more distraction with higher noise level (construction work being carried out near the child care centre). This could have distracted Anthony's concentration visually as well as audibly. Third, the change in person carrying out the role-play with him (from the researcher to his peer) could also have contributed to the loss in confidence and maybe created some confusion with a routine that he was getting used to. And fourth, his attachment to his mother as well as her absence could have caused him to be emotionally upset. Normally, Anthony's mother would be waiting outside for him after each teaching session to bring him home because it was conducted at the special school. However, at the child care centre, Mummy was not waiting around to bring him home after the sessions because it was not time for her to pick him up yet. The intervention sessions were usually conducted between nine to ten o'clock in the morning while other children were having outdoor play, and Mummy usually came later at about one o'clock in the afternoon before the other children took their nap. To Anthony, he may have missed the assurance, the comfort, the love and security that he has associated Mummy with. The researcher has observed that he will usually walk to the window after the sessions had been conducted at the child care centre and say "Mummy will come" or "the children are coming back" even though they had not come back from outdoor play, as a form of reassurance to himself.

Anthony's mother was invited to come to the child care centre when the researcher carried out the first few sessions of Phase D again. She was allowed to sit at a corner at the far end behind Anthony. He could see her if he turned his head and looked behind him. Although he said a couple of times "Mummy is waiting", he was not distracted from the role-play. Subsequently, Mummy was not present in the remaining sessions and Anthony did not display anymore emotional upset for the return to Phase A and the follow-up. Sometimes, the researcher will reassure Anthony at the beginning of the sessions that "Mummy will come" with the intention to put his mind at ease.

CHAPTER 6

STUDY III

Introduction

Matthew (a pseudonym) was the third child involved in this research. Like the two participants in Study I and Study II, Matthew is considered a higher-functioning child with autism because of his normal intelligence and IQ score. However, he displayed less verbal and interactive skills compared to the other two children.

Matthew is a 7-year-old boy who was diagnosed by child psychologists and therapists as having autistic characteristics that fit the DSM-IV classification of pervasive developmental disorder (American Psychiatric Association, 1994). He lacks social or emotional reciprocity and fails to develop peer relationships appropriate to his developmental level. There is a marked delay in the development of his spoken language with an impairment in the ability to initiate or sustain conversation with others. Matthew also lacks varied and spontaneous make-believe play or social imitative play appropriate to his developmental level and displays restricted patterns of interest that were abnormal in focus. Matthew was assessed by the professionals using The Autism Checklist and The Leiter International Performance Scale (Leiter, 1948). He scored an IQ of 110 and his Autism Quotient on the Gilliam Autism Rating Scale (Gilliam, 1995) was 69.

Matthew is the eldest child in the family. He has a twin brother as well as a younger brother who is 3 years and 8 months old. Both his parents work full-time and the boy is cared for by the housemaid when they are busy or away at work. In the evenings, his parents talk to him about common everyday topics concerning school and family.

They also help him in his homework to prepare for mainstreaming into a regular education setting next year. Matthew's favourite past-time at home is watching children's video programmes (especially 'Sesame Street') and playing with computer programmes. His mother sometimes uses these activities as rewards when he finishes his homework. He also likes art and craft activities and particularly enjoys painting and clay moulding. However, the boy rarely plays with his brothers. He occasionally talks to them during computer time or television time. Even then, he does not really carry out a conversation with them but rather verbalizes his thoughts aloud regarding what he sees on the computer or television and when he wants to have his turn. He usually speaks to his younger brother only when the latter disturbs him. From his behaviour at home, it is clear that he lacks social and emotional reciprocity. There is no spontaneous seeking to share enjoyment, interests, or achievements with other people.

Matthew attends kindergarten classes in a regular setting at a local Child Care Centre during weekday mornings and an hour of therapy classes at the Special School once a week. There are plans for him to attend special classes with extended time on a daily basis. The teachers and principal at the child care centre have observed that Matthew rarely initiates conversation or interaction with his teachers or peers. He has to be reminded and encouraged to join in during class lessons and group activities. The only time he participates willingly on his own is during outdoor play time. He tends to be alone most of the time. After 8 months at the child care centre, Matthew still failed to develop peer relationships or use nonverbal behaviours to regulate social interaction.

The therapists at the special school have listed social, emotional development and

interactive play as the learning goals for Matthew. He needed to be able to greet familiar people spontaneously, to request wants verbally, to participate in simple games with simple rules, to follow instructions, to call out or attend to the other participants and to initiate play verbally. All these goals come under the area of social communication skills which Matthew lacked and showed a marked delay in his developmental growth. To help him improve his social skills, he needed to be taught to increase his spontaneous eye contact and eye contact on request, and to increase appropriate verbalizations so that he could express himself better and interact with others. This research used sociodramatic play to enable him to take on different roles which provided the opportunities for him to ask questions like "What?", "Which?", "Where?" and so forth. By promoting his ability to interact verbally and visually, it was hoped that he would learn to initiate more social contact with others. Improving Matthew's social communication skills was a major aim in getting ready for mainstreaming.

The methodology in this study was based on a single-subject case-study which followed an A-B-C-A design. A was designated as the baseline and B and C were the teaching intervention phases of the study. A trained peer was present to provide the sociodramatic play and interaction during baseline, return to baseline and the follow-up. Each teaching intervention session was conducted with a teach-test-teach-test format and all the sessions were recorded on video for data analysis. Data collected were based on the number of verbalizations and the total number of seconds of eye contact that Matthew exhibited within each 2-minute session. The results showed that both Matthew's eye contact and verbalizations improved after the teaching interventions. The average

number of verbalizations he was able to give within each 2-minute interval increased by 5 times, from 0.8 at baseline to 4.6 for the return to baseline. His average total length of eye contact within each 2-minute interval doubled from 2.6 seconds at baseline to 5.8 seconds.

Method

Peer Training

The participant in this research was a 7-year-old boy named Matthew who was diagnosed as having autistic characteristics in his speech and behaviour. His partner for the peer intervention was a normal boy named Adrian who was several months older than Matthew. Both boys attended the same kindergarten classes at the child care centre. However, Adrian has graduated from kindergarten into grade one this year while Matthew is waiting for his turn to be mainstreamed next year. The peer was chosen on the basis of his social competence (ability to verbalize and hold conversations), maturity (confidence in social skills) and willingness to participate.

The peer was given one training session prior to the first intervention session of each phase. He was shown how to play the different roles with the respective training material. The same teaching intervention was used to teach the peer. The researcher taught the strategy and modelled each role before asking the peer to emulate the activity. Instructions were also given to help the peer guide the participant in the role-play. The researcher said : "Adrian, if Matthew keeps quiet, you must keep talking to him or use the toys to get his attention so that he will ask you a question or give you an answer". He was also told "If Matthew does not look at you, you must make him look at you by calling his name, looking at him or using the toys to get his attention so that he will look at you".

Setting and training material

Training and teaching intervention sessions for Phases B and C took place at the special school in the mornings during regular school days. Baseline observations and peer interventions for the return to A and follow-up took place at the child care centre whenever the other class children were having their outdoor play in the morning. The training room was set up with a table, two stools, and another table for placing the training materials. A similar set up was enacted in a small multi-purpose room in the child care centre. It was necessary to use two similar settings rather than use the same training room was because it was difficult to arrange for the peer to be present at the special school.

Training material included toys or various kinds: hats belonging to different occupations (e.g. postman, waiter and doctor), accessories and peripherals (e.g. parcels, letters, stamps, cards, basket of fruit and food items, crockery set, tea and coffee set, eating utensils, medical kit with stethoscope, thermometer, medicine bottles, etc.). A video recorder was used to tape the baseline observations, teaching sessions, testing sessions and the follow-up.

Design

The research study used an A-B-C-A design and included one follow-up of five 2-minute sessions. A was the baseline, and B and C were designated as the teaching interventions and conditions. The independent variables or conditions which Matthew was required to interact with others were the same as those listed in Table 2. The two dependent variables were the number of appropriate verbalizations made by Matthew and

the total length of time (in seconds) in eye contact when interacting with his peer within each 2-minute interval.

Procedure

Phase A was the baseline where the researcher observed and recorded data for five two-minute sessions of Matthew's role play. Phases B and C were conducted with a teach-test-teach-test format that consisted of two-minutes teaching and two-minutes testing. Five sessions were conducted for each phase. Return to Phase A was similar to baseline except that Matthew was being observed and tested on how well he performed after he had been shown how to role-play with eye contact and verbalizations with the researcher after the teaching interventions. A follow-up on Matthew's performance was arranged and a total of 25 sessions were provided over a 4 week period.

Teaching intervention. At the beginning of each 2-minute teaching session, the researcher first taught the child to use the strategy. The researcher said: "Matthew, when someone talks to you or when you talk to someone, you must remember to do three things. First, you must *look* at the person's eyes. Second, you must *think* of what to say. And third, you must open your mouth and *talk*". Repeat the three key words *look*, *think*, and *talk* with actions (fingers pointing to the eyes, the head and the mouth as each word is being said). The researcher then repeated the strategy and asked the child to repeat it after her. Finally, the researcher asked the child: "Matthew, what must you remember to do when someone talks to you or when you talk to someone?" The child was expected to recall the strategy by listing the three activities.

The researcher proceeded to introduce the different roles with the accompanying hats,

toys, accessories and peripherals (e.g. "This is the postman's hat and here are some letters, parcels and stamps he would use." "A postman goes to your house to deliver letters and parcels", etc.). The start of the activity is *prompted* by the researcher saying: "Let's play....." (e.g. "Let's play the postman") and "It's my turn".

The researcher modelled eye contact by looking into the child's eyes every time she talked to him and demanded eye contact verbally or non-verbally when he did not give eye contact when he talking to her. The researcher modelled appropriate verbalizations by greeting him appropriately, demonstrating social behaviour, encouraging conversation and extending conversation during the role-play. The child is *greeted appropriately* by saying "Hello!", "Good morning postman", or just by calling the child by name.

The researcher *demonstrated social behaviour* by providing frequent and varied examples of appropriate role-play and social skills. It included giving eye contact, turn taking, and initiating questions, answers and statements like "Can I help you?", "What would you like to eat?", "No, I don't have any strawberry ice-cream", "I have a hamburger, a sausage roll and pizza", "Here's your coffee", "Enjoy your lunch!" and "Thank you".

To *encourage conversation*, the researcher offered or withheld play objects while waiting for the child to give a verbal request or response. This was done instead of using gestures like reaching out to take the desired object on his own, pointing, nodding or shaking his head. If the child was quiet, the researcher would keep talking and asking questions to guide and elicit a response or answer from the child in order to proceed with the role-play.

To *extend conversation*, the researcher expanded on the situation and role that was being played. The topic of conversation centred around the play objects and role-play activities. The researcher would ask or say “Do you have a fever?”, “Let me check your temperature”, “You have a high fever”, “This medicine is for your fever”, “Take one teaspoon three times a day” and “Do you have a cough?”.

Testing intervention. At the beginning of each 2-minute *testing* session, the researcher *prompted* the child by saying: “Let’s play.....” and “It’s your turn” or “It’s Matthew’s turn” if he was role-playing with a peer. At the end of each session, the researcher would say “Thank you Matthew, you have finished playing the (postman) ”.

Phase A: baseline condition. The trained peer remained with Matthew for the testing period. The researcher *prompted* only at the start of each observation session and *did not model* the teaching strategy. Data was collected based on the researcher’s observations on Matthew’s eye contact and verbalizations during role-play.

At the beginning of the *testing* phase, the researcher introduced the training material and the roles to be played: “Here are some hats that people wear to do their work. This is a postman’s hat, this is a doctor’s hat and this is a waiter’s hat” and “The postman will go to your house to deliver letters and parcels” and “The doctor will check you at the clinic when you are sick” and “The waiter will serve you food at the restaurant when you are hungry” and “These are the things the postman has: letters, parcels and some stamps” and “These are the things the doctor has: stethoscope, thermometer, medicine,” and “These are the things that the waiter has: plate, cup, spoon, fork, knife, fruit, food, drinks,” . The trained peer was asked to play one of the roles first,

then the participant would have his turn next. For example, "Adrian will play the postman first, then Matthew can also play the postman later". "Let's play the postman, Adrian, it's your turn". When the peer has finished, the researcher said: "Thank you Adrian, for playing the postman". "Now, it's Matthew's turn to play the postman". "Are you all ready? ...okay". "Let's play the postman, Matthew it's your turn". This order and turn taking was kept until the participant had completed the five sessions at baseline.

Phase B: child with researcher and feedback. During the *teaching* phase, the researcher *prompted and modelled* the strategy as described in the teaching intervention. The researcher undertook role-play with the child to encourage appropriate use of eye contact and verbalizations to promote the development of social skills.

During the *testing* phase, the researcher responded in two ways: in the role played and in giving feedback. When responding in role, the researcher would answer the questions given by the child or direct questions at him to elicit a response. She would also look at him whenever she talked and keep the topic of conversation going for each 2-minute session. When responding by giving feedback, the researcher smiled, nodded and gave verbal reinforcements such as "That was good looking" or "Good boy for looking at me" (for eye contact) and "That was good talking", "That was good asking", or "Good boy for answering my question" (for appropriate verbalizations). Feedback was necessary at the initial stage to guide Matthew in understanding what was expected of him and when he was doing it correctly.

Phase C: child with researcher and no feedback. During the *teaching* phase, the researcher *prompted and modelled* as she did during Phase B. However, during the

testing period, the researcher only responded in role by giving appropriate eye contact and verbalizations and did not give any corrective feedback to Matthew.

Follow-up. The follow-up was conducted one week after return to baseline. The follow-up was the same as baseline but included a few novel toys added to the role-play (e.g. a plaster in the doctor's medical kit, an orange in the waiter's food basket, and an inking stamp in the postman's package). The main reason for doing so was to observe if Matthew was able to generalize the skills he was taught, that is giving appropriate verbalizations and eye contact while role-playing with these novel stimuli. The novel toys were also provided to lend some variation to the role-play materials and prevent monotony from setting in. During the five sessions, observations and data were collected while Matthew engaged in the same role-play activities with the trained peer again.

Recording of data. Data were collected systematically. This involved reviewing and recording the number of appropriate verbalizations and total length of eye contact from videotapes onto data collection sheets as shown in Table 3 for all the test sessions for data analysis. The video camera was focussed on the participant throughout each 2-minute recording to fully capture all his verbal and non-verbal responses.

Inter-observer reliability. Inter-observer reliability was calculated for 20% of the sessions, across all the phases including the follow-up for both dependent variables by measuring the occurrences of eye contact (in seconds) and the number of appropriate verbalizations. The child psychologist who have been working with Matthew measured and recorded the dependent variables through viewing the videotape. One session was chosen from each phase and follow-up on a random basis (5 sessions out of 25).

For the number of verbalizations, the percentage of agreement between the researcher and the individual observer was 75.0% and for eye contact it was 70.7%. The percentage of agreement was obtained by totalling up the number of verbalizations or seconds of eye contact recorded by the researcher, dividing it by the total number of verbalizations or seconds of eye contact recorded by the individual observer and multiplying it by 100.

Results

Verbalizations

The number of appropriate verbalizations given within two minutes of role-play per session is depicted in Figure 6. During baseline (Phase A), Matthew talked rarely and gave only an average of 0.8 verbalization over the five sessions. There were zero verbalizations for the first four sessions of role-play. However, he managed to make four appropriate verbalizations in the fifth session. His verbalizations were mainly single words like "yes", "parcel" and "stamps" spoken when he was playing the role of the postman.

After the first teaching intervention in Phase B, the average number of appropriate verbalizations increased to 4.2. There was an improvement in the frequency and vocabulary of Matthew's appropriate verbalizations compared to baseline, but the verbalizations still primarily consisted of single words with some echolalia. However, on the last session in this phase, Matthew showed improvement both in the frequency as well as in the length of his verbalizations. He could give two-word or three-word verbalizations appropriately like "five letters" "two stamps," "a small parcel" and "bye-bye". This was his peak performance even though echolalia was still present. However, echolalic verbalizations were not accepted as appropriate verbalizations for data collection.

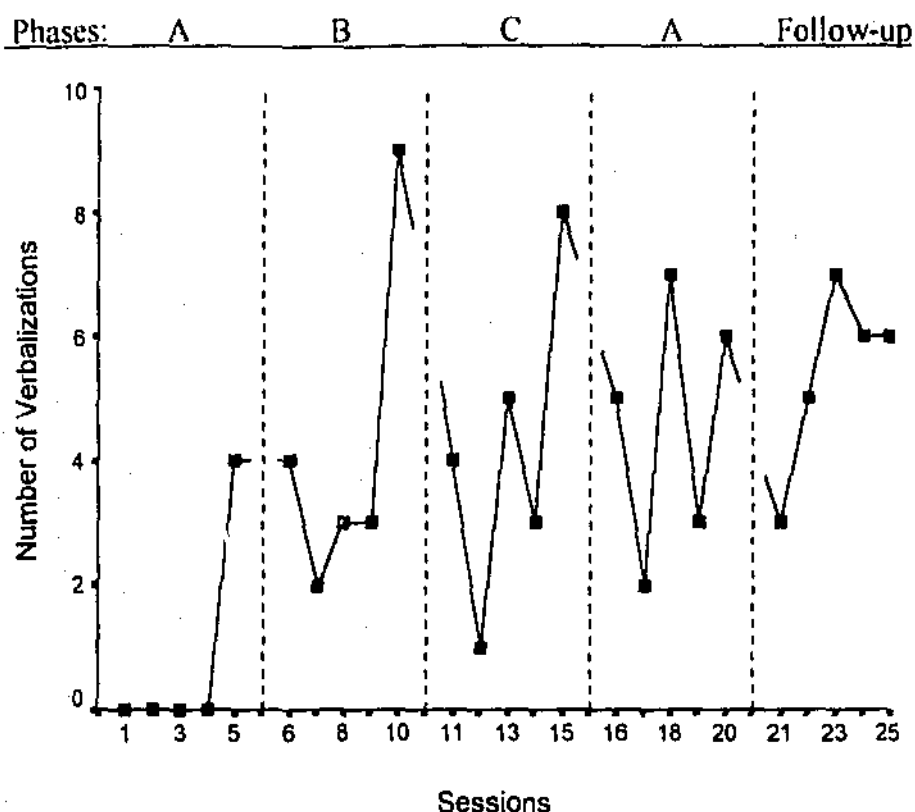


Figure 6. Number of appropriate verbalizations per 2-minute session.

Semilogarithmic charting could not be used for this graph because there were four data points with zero occurrences for appropriate verbalizations at baseline. Therefore, an equal-interval scale was used.

In the second teaching intervention Phase C, the average number of appropriate verbalizations remained at 4.2. Initially, there was a decrease in verbalizations for sessions 11 and 12. In session 12, the participant only made one appropriate verbalization and that was when he greeted the researcher at the beginning of the role-play. Thereafter he proceeded to role-play with non-verbal interactions. This could be due to two possible reasons. First, feedback from the researcher was withdrawn in this phase when he gave appropriate verbalization, thereby removing any impetus or

motivation to repeat the desired behaviour. Second, he was preoccupied with the toys he was using to check the 'patient' while in the role of a doctor. The researcher had to keep talking to direct his attention away from the toys several times in order to continue with the role-play. Matthew's preoccupation with toys and objects is a distinct characteristic of autistic children. Their inability to shift away from a particular activity that has been the focus of their attention is quite common. The last session in Phase C saw Matthew's number of appropriate verbalizations among the highest in the graph. He was able to give eight verbalizations appropriately compared to only four appropriate verbalizations in the last session at baseline. This was double his initial performance before training.

When the participant was asked to role-play with the same trained peer again for the return to Phase A, he was able to maintain as well as slightly increase his performance to an average of 4.6. However, there was a consistent pattern of rise and fall in verbalizations over the five sessions. This fluctuating pattern represented some instability in his performance. He was able to give 8 – 9 appropriate verbalizations in some sessions but only 3 – 5 appropriate verbalizations in other sessions.

Matthew's performance showed better stability and maintenance in the follow-up. His appropriate verbalizations displayed an increasing trend for sessions 21, 22 and 23, with a huge decrease in fluctuations of data compared to the previous phases. He maintained his performance at six appropriate verbalizations for sessions 24 and 25 and the average showed a further increase to 5.4 appropriate verbalizations. There was also less echolalia as observed by the researcher. However, his length of verbalizations remained very much between one and two words long (e.g., "pizza", "pepsi-cola",

"twenty dollars") and sometimes were three words long like "pear and orange". When it comes to counting letters and stamps or listing the things he has as a waiter to his customer, he was able to verbalize up to eight words at one go.

Matthew's verbalizations were mostly answers or think-aloud statements to the researcher or peer. He asked questions rarely even though he used eye contact or gestures for interaction in the role-play. For example, if Matthew wanted to give the peer some letters, he would just look at his peer and stretch out his hand with the letters to him, or count aloud "1, 2, 3, 4, 5" and give all the letters to his peer. He would not have said "Here are your letters" or "You have five letters". When he was playing the role of a waiter he usually would not ask "What do you want to eat?" but look at his peer and start to give out the food items or offer the whole basket of fruit to his peer. To initiate conversation, the peer asked him "What do you have?" and Matthew answered "hamburger, cake, banana, apple". He did not ask "Do you want a hamburger?" but held the hamburger in his hand and looked at his peer for a response. If he remained quiet, his friend said "I want a hamburger" and Matthew gave the hamburger on a plate. If his friend said "No, I don't want a hamburger, I want a banana", then Matthew would give him the banana and sometimes say "banana" at the same time as a 'think and talk aloud' process.

According to the child care centre's principal, Matthew had more difficulty in speaking than in reading. One possible way of guiding him to learn how to verbalize is to tap on his reading skills. Therefore, after the follow-up, the researcher used word cards in addition to the toys as training material for the role-play. These cards contained words

for asking questions, pronouns, conjunctions and verbs to guide Matthew in constructing appropriate questions and sentences. How the word cards were used to enhance the teaching intervention for Matthew can be seen in Table 4. The role-play with word cards and toys were demonstrated progressively for Matthew to learn and feel confident in verbalizing. Words were slowly added on to construct and extend a question. Some words were also changed appropriately to help him understand how to use the sentence to ask it differently. For example, "What do you want?" can be lengthen and changed to "What do you want to eat?" or "What do you want to drink?" One session of 5 minutes teaching and 5 minutes testing was conducted and the results were very encouraging because he was eager and more confident to verbalize since he could read out the questions as well as the common words used in a social context. For example, while playing the role of the waiter, besides able to ask "What do you want to eat?" and "What do you want to drink?", he could also ask "How many do you want?", "Do you want an orange?", "Do you want some sugar?", "please", "thank you" and so forth.

Table 4 - Examples of word cards used for constructing questions

Sample words for asking questions:

What	Which	When	Where	Who	Why
Do you	Can you	Can I	How much	How many	Please

Sample words used for constructing questions:

want	eat	drink	hamburger	banana	juice	tea	milk	sugar		
buy	stamps	cards	feel	have	pain	fever	open	mouth		
a	to	your	give	me	show	share	tell	help	play	with

Sample questions for the role-play:

What	do	you	want	to	drink	?	
Do	you	want	to	eat	a	hamburger	?
Which	do	you	want	?			
How	much	sugar	do	you	want	?	
How	many	stamps	do	you	want	?	
Can	you	open	your	mouth	?		
Do	you	have	a	fever	?		

Sample questions for social interaction:

Can	I	play	with	you	?
Can	I	share	?		
Can	you	show	me	?	
Can	you	give	me	?	
Can	you	help	me	?	

The standard deviations for the verbalization scores were 1.6, 2.48, 2.32, 1.85 and 1.72 for phases A, B, C, return to A, and follow-up respectively. Phases A, return to A and follow-up show less variability in Matthew's scores because they were less than two standard deviations away from the mean distribution. The scores were generally better for phases B and C (teaching interventions) but there was also more variability. Matthew's good verbalization scores was regularly alternated with near baseline performance. An improvement in the variability of his scores can be seen in the follow-up where there were less fluctuations and an indication of an increasing trend in his verbalizations. In addition although Matthew did not achieve a high level of verbalization consistently, the slopes of progress throughout the phases also show an increasing trend.

Eye Contact

Figure 7 depicts the total number of seconds of eye contact given within each 2-minute session of role-play. During baseline, Matthew's level of eye contact was relatively high initially, 5 seconds each for the first and second sessions. In Session 1, Matthew gave the most eye contact when he was role-playing the doctor and pretending to put eye drops into his peer's eyes. In Session 2, most of his eye contact was given when he looked and observed his peer pretending to eat and drink as a customer. His eye contact fell to a consistently low level of only 1 second for the third, fourth and fifth sessions. In Sessions 3 and 4, he hardly looked at his peer and he did not talk when he was role-playing. Although there was an increase in verbalizations for Session 5, Matthew again gave only 1 second of eye contact to his peer when he said "Yes" while playing the role

of a postman. The average total length of appropriate eye contact given at baseline was 2.6 seconds.

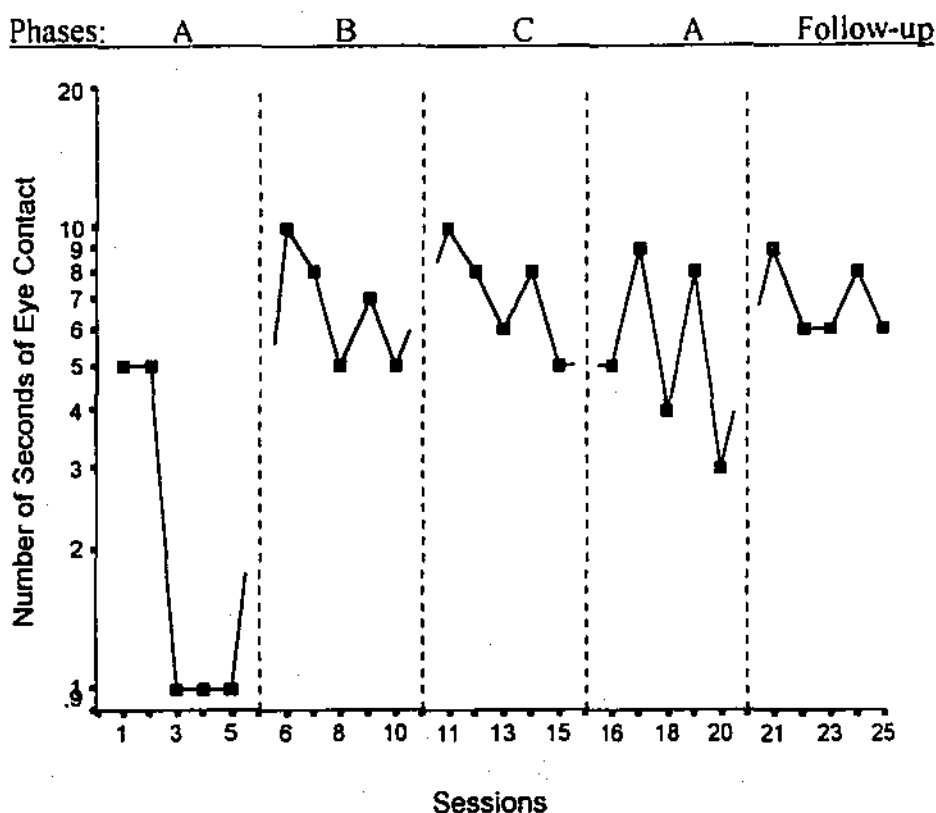


Figure 7. Number of seconds of appropriate eye contact per 2-minute session.

Semilogarithmic charting was used for this graph. The graph reflects the rate of change rather than the amount of change and may more accurately reflect the effort involved in teaching and learning. Some researchers have advocated for the use of semilogarithmic charts (Wolery, Bailey, & Sugai, 1988; Lindsley, 1964) as a precision teaching approach to applied behaviour analysis.

Matthew showed a marked improvement in his eye contact in the first session of the teaching intervention in Phase B. He gave a total of 10 seconds of appropriate eye contact to the researcher while playing the role of a waiter. He was looking at the

researcher spontaneously throughout the role-play. This could be attributed to the strategy taught ('Look, Think and Talk') and the modelling done by the researcher. The role-play was kept at a quick and lively pace and the researcher also talked a great deal more to him than the peer at baseline. Therefore, a combination of these factors may have directed his eye contact to her. Although there was a decrease in eye contact given over the next two sessions, Matthew's average performance level over the five sessions in Phase B was 7.0 seconds of appropriate eye contact compared to 2.6 seconds at baseline. This showed an increase of 4.6 seconds after the training intervention.

In Phase C (teaching intervention without feedback) the average total length of eye contact over five sessions rose further to 7.4 seconds. The pattern in his performance was similar to Phase B, and the graph showed consistent rise and fall in the total length of eye contact given.

For the return to Phase A, the pattern in his performance began to change and showed more fluctuations as indicated by increased variability in performance. Interestingly, the fluctuations were also of a reversed pattern. That is, if there was an increase in eye contact, there was a decrease in verbalization for the same session, and vice versa. Only the first session in this phase showed eye contact moving favorably in the same direction as verbalization, for example, there were 5.0 seconds of appropriate eye contact with 5.0 appropriate verbalizations. Looking at the data collected, it is clear how this pattern came about. When there was more eye contact and less verbalization, Matthew usually gave a verbalization and proceeded to role-play quietly and slowly. He would be looking at his peer and concentrating on the activity, but he did not talk much as he played. On

the other hand, when there was more verbalizations and less eye contact, he was either trying to list most of the things he had verbally or concentrating on talking about the things and activities with little eye contact. However, on the average, he was able to give 5.8 seconds of eye contact in this phase for each 2-minute session. This was considerably better than 2.6 seconds at baseline.

Matthew's performance showed much improvement in the follow-up compared to the previous phase. The average total length of appropriate eye contact given within each 2-minute session was 7.0 seconds. The graph also displayed less fluctuation and indicated some maintenance at 6.0 seconds of appropriate eye contact for three out of five sessions. At baseline, Matthew gave 5.0 seconds of appropriate eye contact for the first two sessions consecutively as well as when the transition was made from Phase C (teaching intervention) to the return to Phase A (peer intervention). The data points were plotted on the graph as short horizontal lines. The recurrence of these lines over the phases with similar data points may best show Matthew's tendency and ability to perform at that level. Generally, Matthew was able to give eye contact by looking at the researcher or his peer before a verbalization or while he was making a verbalization. He was observed to give eye contact more easily than to give verbalization.

The standard deviations for eye contact scores were 1.96, 1.90, 1.74, 2.32 and 1.26 for Phases A, B, C, return to A, and follow-up. The variability in Matthew's scores were relatively high except for the follow-up which showed less fluctuation. The scores were mostly between one to two standard deviations away from the mean except for the return to A phase which showed more extreme scores. Similar to the graph for

verbalizations, Matthew's increase in eye contact scores were regularly alternated with a drop in eye contact scores. Overall, although there were fluctuations in Matthew's eye contact scores, his level of performance has increased and remained consistently higher as indicated by the graph. Matthew's average eye contact level doubled from 2.6 seconds per 2-minute interval at baseline to 5.8 seconds in the return to baseline phase. It was further improved to 7.0 seconds in the follow-up.

Discussion

Verbalization

The results of this research suggest that the teaching strategy and interventions aimed at increasing Matthew's verbalizations and eye contact have been successful in helping him communicate verbally as well as visually during social interactions with others. Matthew showed fluctuations in his performance as he attempted to use appropriate verbal language during the sociodramatic play. There was an encouraging increase in his ability to verbalize after the teaching intervention because his verbalizations did not fall back to zero as in baseline. The last five sessions of Matthew's performance in the follow-up indicated a potential growth in his verbal skills as there was an increasing trend with less fluctuation. The number of appropriate verbalizations spoken by him ranged from 1 to 9 per 2-minute session throughout the various phases and his length of verbalizations showed an increase from one word to three words. His ability to utter more words per verbalization after the interventions meant that he was able to express himself better verbally within a social context instead of using a mono or dual syllabic word as a verbal initiation or response. With an improvement in verbalizations there was also a decrease in echolalia as observed by the researcher. With less of an echolalic tendency and a reduction in the frequency of imitating the words of the researcher or peer in an exact manner, Matthew used more of his own words, besides those words that he had learnt to use in asking or answering appropriately. By using some of his own language, his responses gradually became more spontaneous and natural, less stilted and stereotyped. Researchers (Charlop & Trasoweck, 1991; Matson, Sevin, Box & Francis

1993) have found that autistic children's appropriate speech can become increasingly more spontaneous, and the value of appropriate spontaneous speech is that it naturalizes the children's speech and permits social interactions besides providing a way for them to obtain information, objects, food and attention. If Matthew is able to display more spontaneous language use besides appropriate verbalizations, his social interaction skills could be further enhanced. It is also necessary to continue teaching Matthew to increase his verbalizations further so that he will eventually reach the level of fluency and spontaneity used in everyday speech.

Word cards as visual cues for verbalization

The introduction of word cards into the role-play after the follow-up showed encouraging results and indicated a strong possibility for Matthew to increase his verbalizations further. The word cards helped him understand how to ask questions better and provided him with a guide or reference. Being a visual learner with a good memory and good reading skills, he was able to read words and sentences and remember what he had read. Therefore, after reading the words on the cards once or twice as he asked a question, he did not need to refer to the word cards again the next time he asked the same question. During the testing phase, he asked questions quite fluently and quickly, with occasional non-verbal prompting from the researcher by just pointing to the word cards. With this recommendation to enhance Matthew's learning, he could be given further teaching sessions incorporating the use of word cards into his role play. The number of sessions will depend on his readiness and fluency. The success of using word cards is supported in the research by Matson, Sevin, Box and Francis (1993). The

use of word cards motivated Matthew to verbalize more during role-play because it was an easier way for him to learn and to understand how to go about asking a question which was appropriate to the situation. Besides increasing the frequency of Matthew's verbalizations, another advantage of using word cards is the possibility of increasing the length of his verbalizations. This can be seen in Table 4 where more word cards could be visibly picked and joined together to make a longer question or sentence depending on what and how he wanted to ask or say. The researcher also observed that Matthew gave eye contact when he became more confident in asking questions. Therefore, with an increase in verbalizations, there may also be a further increase in his eye contact.

Eye contact

As a result of the teaching intervention, Matthew was able to double or triple the total length of eye contact he gave for the various phases. He was able to give both eye contact on request as well as spontaneous eye contact. Matthew was observed to be more aware of looking at people when someone was talking to him or when he wanted to talk. He tended to use spontaneous eye contact as a form of nonverbal communication and as a way of learning from others, like initiating interaction by looking at the person or when he was looking at the researcher or peer while they were role-playing as in observational learning (Werts, Caldwell & Wolery, 1996). Gaze interaction is described as a process of learning in which the child acquires understanding of relationships among people, actions, and events within the environment (Tiegerman & Primavera, 1984). This also affirms Kozloff's (1974) belief that children need to learn the basic behavior of paying attention before they can learn much in any other skill area. The improvement in

Matthew's eye contact can be attributed to the consistent strategy in which the three main steps of communication were taught, that is, to "Look, Think and Talk". He was reminded to "look" every time the strategy was taught by the researcher and when he was asked to recall what he had to do before each role-play session. He was able to recall the three steps in the strategy easily by the fourth session in Phase C, and he used hand gestures to accompany his verbal recall. Matthew's readiness to "look" at people was higher than his readiness to "talk" to people. Through the eye contact he gave, he appeared quite observant of the verbal or non-verbal interaction during the role-play sessions. His success in learning social skills through eye contact could motivate him to pay attention further and raise his eye contact higher to the next level. The increase in Matthew's total length of eye contact time was maintained over the phases.

Learning behaviour

Matthew appeared to be a quiet and receptive child during baseline, and this behaviour was rather consistent throughout the phases. During the teaching interventions, the researcher through her modelling and prompting procedures aimed to motivate Matthew to take a more active role and be more expressive in his responses. After the teaching interventions, he showed some improvement in his expressive responses and could carry out the various role-play activities. He displayed receptive language through his understanding of what was taught and said and through his ability to answer appropriately when questioned or when verbalizing something that he had learnt. Although he was able to verbalize, Matthew was observed to take a more passive role in initiating verbal interactions compared to his peer. He either waited for his peer

to initiate social interaction or he tended to use hand gestures and eye contact to communicate. His lack of use of expressive language was not due to his refusal to speak, but more to a lack of awareness of using speech to communicate and knowing how to initiate verbally. For example, he was able to initiate verbalizations and interaction much better when the word cards were used as a visual cue to guide him. Schneider (1989) advanced the notion that children who have difficulty interacting with peers may be indicating a failure to apply skilful behaviour rather than a lack of social skills. That is, they may interact with others if they know how to proceed and sustain the interaction. The researcher also observed that Matthew who usually appeared to be soft-spoken during interventions was able to ask a question clearly and loudly after the word cards were introduced to help him in his verbalizations. This could be attributed to his ability and confidence to read with visual aids. Therefore after some practice, he was able to maintain a good asking voice and good question-asking skill when the word cards were removed. This may resemble some of the successes of past researchers in using social scripts for teaching autistic children. Matthew was able to make choices regarding the roles he wanted to play and was quite happy to select the corresponding hat to wear for each role. Being able to exercise his preferred choice for sociodramatic play for each session may have contributed to his overall improvement in eye contact, verbalizations and social interactive skills (Peck, Wacker, Berg, Cooper, Brown, Richman, McComas, Frichmeyer & Millard, 1996; Piazza, Fisher, Hagopian, Bowman, & Toole, 1996).

CHAPTER 7

DISCUSSION

The teaching interventions in this research provided opportunities for increased social interaction for all the three boys who gave better eye contact and more verbalizations. Comparing behaviour before and after intervention revealed better eye contact as seen in the form of more eye gaze and looking at partner more often than face away behaviour. Being indifferent to other people and lacking in play and imagination have been listed as some of the deficits of autistic children by the National Autistic Society (London) as well as the DSM-IV diagnostic criteria (1994). However, as a result of increased eye contact, the children in this research developed more awareness of people and objects that were present in each social context. The majority of the time they showed eagerness to participate, curiosity with the materials and familiarity with the procedures. They also had ample opportunities to practise social skills in terms of turn taking, waiting, listening, and exercising appropriate behaviours besides looking and talking.

All the three boys displayed acceptable social behaviour by not engaging in aggressive or self-stimulatory behaviours. Verbalizations increased in the form of more total words spoken through question-asking, answering and conversation topics. That is, the length of verbalizations were generally much longer after the teaching interventions, especially for the children in Study I and II. This was also seen in terms of more vocabulary words used that were specific to the roles played (e.g., doctor - thermometer, eye drops, fever, sore-throat, stomachache, medicine, plaster, etc.). Social greetings, comments and farewells commonly used in our everyday lives were also indirectly and naturally learned as a

result of the pretend play (e.g., "Hello", "Good morning", "Can I help you?", "Don't worry, I'll wipe it", "Enjoy your lunch", "Good-bye", "Thank you for coming", etc.).

The children have developed some functional expressive language as a result of the intervention. The success of increasing such aspects of verbalizations in a sociodramatic context is supported by the findings of Levy, Wolfgang and Koorland's (1992). Other improvements related to verbalizations included a decrease in echolalia, more verbal initiations, more spontaneous language, and an increased use of their own language. Indication for further growth in the children's frequency of appropriate verbalizations can be seen in their results which showed an increasing upward trend as well as maintenance in the follow-up sessions. The results from Charlop and Trasowech (1991) also showed positive effects of intervention that increased autistic children's daily spontaneous speech.

There were other similarities in the behaviour and performance of the three participants. The boys were attracted to the hats and toys used for the various roles they played. They were happy to put the hats on themselves as well as for the researcher and their peers. They also indicated a preference for certain hats, especially the waiter and postman. This in turn led them to perform better when playing those roles. All of them could begin each session by greeting the researcher and peers verbally and saying "Bye-bye!" with eye contact to end the role-play. They showed that they understood the different social situations they were playing by responding appropriately and staying in context. The introduction of novel toys as stimuli and variation captivated the attention of the children, but in varying degrees. According to Koegel, Rincover and Egel (1982),

teaching sessions which incorporate variation in tasks and materials can produce more student responding, enthusiasm, and happiness than when all stimuli remain constant. The positive effect in this research was that the novel stimuli provided motivation for more verbalizations, relation to familiar objects and application of skills taught. The negative effect was the increased preoccupation with those novel objects, especially for the child in Study I. The marked increases in verbalization accompanied by low eye contact in some sessions were largely due to the child's eye gaze being focussed on objects and activities rather than on the person with whom they were interacting. Fidgety behaviour included sliding the hats back and forth over their heads and rocking their chairs while sitting. However, these minor habits did not disrupt the execution and flow of the pretend play.

Some differences in the behaviour and performance of the three boys can be seen in the way they coped with the teaching interventions. The first child in Study I who displayed the most verbal skills also showed the most confidence and control of the role-play to the point of being domineering in some sessions. For example, he would pass a remark to try and end a session if he encountered some difficulties during play (e.g., "It's getting late, we have to go back to school", "The phone is ringing"), and insist that the customer ate his ice-cream and used the spoon. The second child in Study II could manage the role-play quite well and also displayed good improvement in verbal skills. However, he displayed emotional difficulties initially when the location of the intervention was changed from a training room to a place in the classroom, and also when the researcher was substituted by the peer for role-play. This was probably due to

anxiety and he reacted by being tearful, remaining quiet and reminding himself that "Mummy will come" or "Mummy is waiting". The third child showed better eye contact than verbalizations compared with the first two children who showed better verbalizations than eye contact. His pace of role-play was also carried out in a slower manner compared with the other two boys and he was observed to be visibly "thinking" about what he was doing or saying. He tended to use facial expression and body gestures to express his wants, feelings and initiations (e.g., frowning, smiling, reaching out with his hand, and nodding). The intervention in this research has been effective in increasing eye contact and verbalizations and improving the social skills of autistic children. The changes in the children's behaviour can be linked to several factors. First, the researcher used a teaching strategy ("look, think and talk") with simple but important steps to guide and remind the children what to do. Second, the prompting, modelling, and feedback provided by the researcher and peers encouraged behaviour and skills to be learnt through observational learning. Third, the use of sociodramatic play presented an interesting approach that appealed to children with common everyday experiences that they can easily relate to. Fourth, the permission to make choices regarding the roles they played and the number of toys they wanted to use in their play generated higher interest and therefore higher learning performance. Fifth, the sessions were conducted consistently on a regular basis for the various phases with follow-ups for all three children.

In summary, this research affirmed the importance of increasing appropriate eye contact and verbalizations to improve the social skills of children with autism or autistic characteristics. The results in this research have demonstrated that autistic children can be taught to ask questions effectively, answer appropriately, engage in a topic of conversation, communicate with eye contact and initiate interactions with other people. All these social skills which they lack can be achieved through the implementation of a systematic teaching intervention aimed at helping these children overcome their tendency to remain solitary and indifferent to the people and environment around them. Functional analysis of behavior has also revealed that, although children with autism have impaired social skills, they can develop relationships with others (Donnellan, Anderson, & Mearos, 1984; Sigman & Ungerer, 1984). Such findings, stand in contrast to the popular image of the autistic child as being aloof (Christof, & Kane, 1991). The present study suggests that individual peers do make a difference to the level of eye contact and verbalizations of autistic participants. Older peers were more successful in modelling the social skills during the intervention. The adult-child (hierarchical) and the child-child (horizontal) relationships described in the research by Hartup and Moore (1990) and used in the present study were important for the development of social skills in meeting their everyday needs for interacting with different people in the community. The ability to interact at different levels with teachers, parents and other adults and with peers, siblings and other children was crucial. This was based on the view that one of the most important requirements for personal survival involves basic social competence (Taffe & Smith, 1993). If the

frequency and type of social initiation in autistic children are usually used as a yardstick for measuring their social development and competence (Hauck et al., 1995), then a needs-based approach would suggest that we should upgrade their social skills (appropriate verbalization with eye contact) as fast as possible so that these children will not lag behind their normal peers or be turned away from services and privileges that are generally offered to the other children. Children who exhibit language delays are often socially disadvantaged (Koegel & Koegel, 1995).

The Individuals with Disabilities Education Act of 1990 (PL 101-476) has affirmed the right of all children to participate fully in the life of the community into which they were born (Brown et al., 1989b; Rapport & Thomas, 1993), but for children with autism the fulfillment of this right may require intensive intervention by individuals (Koegel & Koegel, 1995). Therefore, there is a need to immerse the children in an instructional configuration (Lenz & Deshler, in press) that is rich with environmental supports to aid their learning and increase the probability of transferring learned skills. Successful acquisition, transfer and generalization requires learning activities that are enjoyable, meaningful and related to their own experiences. This research has found that this can be achieved through successful role-play of familiar roles like the waiter, postman, and doctor. Less compelling roles have been those of the mechanic and policeman.

According to other researchers (Baron-Cohen, 1987; Rutter, 1974), children with autism exhibit a profound difficulty in assuming another's role due to their impairment in spontaneous symbolic play and their play complexity. That is, the number of combined actions related to a single goal or theme is limited (Baron-Cohen, 1987;

Stahmer, 1995). However in the present research, the encouraging performance of the three autistic boys indicates that it is possible to reduce that difficulty. The increase in appropriate verbalizations, improved eye contact and social behaviour in the roles they played supports this conclusion. Success in looking, talking and assuming roles for various social contexts may be sufficient to create a healthy cycle of learning, so as to enhance further acquisition of new skills and information. The practical advantages of this kind of intervention have been supported in previous research (Laski, Charlop & Schreibman, 1988; Levy, Wolfgang, W Koorland, 1992), and may lie in its easy and pleasurable implementation. Its usefulness may be extended to the home environment by the child's caretakers. Furthermore, because play training appeared to be enjoyable for the children and motivation to engage in sociodramatic play was high, this intervention may be an unobtrusive and cost-effective way to bring about dramatic behaviour changes in children with autism (Thorp, Stahmer, & Schreibman, 1995).

Limitations of the study

The procedures and approach of the teaching intervention in this research have met with success. However, Tremblay et al.(1981) have stated that different approaches are usually successful with different children. This is true because autistic children have different ability patterns and manifold individual characteristics. There is a need to recognize this basic limitation when applying the interventions used in this research to other autistic children who meet similar criteria for age, mental ability and social deficits.

Play experiences and peer interaction are usually studied together, so the influences of each factor cannot be isolated (Piaget, 1951; McHale & Olley, 1982). Therefore, it may not be possible to measure which factor contributed more to the increase in eye contact or verbalizations since different play experiences usually involve different kinds of interpersonal experience. However, future research that isolates novel stimuli and choice-making to promote eye contact and verbalizations could determine the degree of effectiveness of such procedures.

Present findings have limited knowledge and insight into how the children perceive the social context and their own thinking processes during intervention and sociodramatic play. Teaching the children to become more aware of their own thinking, speech and actions may help to increase their level of learning and ability. Cognition and language interact to influence social competence (Kavale & Forness, 1996). Therefore, the dynamics among these dimensions require further study.

Future research is also needed because this research did not examine the use of

teachers of varying degrees of skill and background as play facilitators, the use of female peers, the type of peer training used, the formats of play and whether the increased language performance and eye contact produced by sociodramatic play generalizes to situations outside the training setting.

A majority of the social skills interventions applied to preschool children have produced favourable outcomes during training and treatment conditions. Unfortunately, one of the most persistent problems in peer interaction interventions is the failure of subjects to continue skill use beyond the intervention period and in different situations. These problems of maintenance and generalization are ubiquitous in many learning situations. Despite excellent displays of appropriate behaviour during training sessions, many children revert to incompetent behaviours at the end of training programs when external aids to success cease (Taffe & Smith, 1993). One possible reason for this is that autistic children return to play sessions with non-trained peers in natural settings and this results in not as many carefully structured interaction opportunities. Therefore, their initiations and responses tend to be lower. Further research on teaching with the intent to transfer and generalize skills may benefit children rather than only focussing on the development and validation of behaviour-change techniques (Chandler, Lubeck, Fowler, 1992). It is important for children to generalize the learned skills taught and learnt, therefore educators should enable children to bring skills and information from one situation and use them to advantage in another.

Recommendations for future research

Overall, the results in this research showed improvement in the social skills of the three participants. However, the teaching intervention may not have been specific enough in targeting individual skills to effect a higher increase in eye contact for the children in Study I and II and more verbalizations for the child in Study III. The following recommendations for more specific eye contact and verbalization training which could be used as follow-up practices or future intervention sessions to cater to each child's individual needs. First, collect pictures of faces displaying various emotions such as happiness, sadness, anger, love, surprise and so forth (Lerner, 1981) and talk to the child about them. Second, teach the child to smile while talking with adults and children by modeling (Speer & Douglas, 1981) because autistic children typically look more at adults who look and smile at them (Churchill & Bryson, 1972). Third, play more games and activities that encourage looking behaviour, paying attention to people's faces, using expressive language to describe themselves and others or the environment. *Make a face* is a creative playset (Illuminations/TMC, 1995) for drawing children's attention to people's facial features and increasing their awareness or focus on the different expressions and feelings, *Talk about* (Kelly, 1996) is a social communication skills package that provides worksheets as follow-up after language and social activities, *The social skills game* (Berg, 1988) is a program to teach children attitudes and behaviours that enhance positive and rewarding interactions with their peers which is designed specifically for children with social skills deficits.

Social interaction scripts may also be useful to guide an autistic child who displays

few verbal skills. These supports should be faded out over time. Researchers (Krantz & McClannahan, 1993; Goldstein & Cisar, 1992) have used a script-fading procedure successfully to teach autistic children to imitate their peers. Word cards with questions related to a theme for role play was used to guide the child in Study III (after the follow-up) in learning to initiate and ask questions appropriately. This was also met with success and there was improvement in the number and quality of verbalizations given by the child with disabilities.

Videotapes can be used to teach or show children their own behaviour as a form of self-awareness and self-evaluation to promote further understanding and learning. Charlop and Milstein (1989) assessed the effects of video modelling on acquisition and generalization of conversational skills among autistic children. The results indicated that the children learned through video modelling, generalized their conversational skills, and maintained conversational speech over a 15-month period. Autistic children with more advanced verbal skills may benefit from learning the basic components of conversational speech, including asking questions, providing contextually appropriate statements, and taking turns to speak.

Children lacking in social competency also need to develop feelings of self-efficacy before they can be expected to expand and continue the use of learned social skills in the dynamic environment of peer interaction. *Self-efficacy* is defined as an individual's perceptions that they can produce and regulate events in their lives (Bandura, 1977, 1982). To develop and enhance self-efficacy, teachers need to provide learners with verbal encouragement and opportunities for successful skill performance, gradually

increasing standards of performance, increasing learner's responsibility, reducing reliance on external help (e.g. teacher, teaching aids), providing feedback and acknowledging anxiety (Taffe & Smith, 1993).

Training should move towards cognitive and metacognitive training. Autistic children should be taught to reflect on their own performance with the aim of improving learning effectiveness and social performance. Coping models can help relieve students' fears and build confidence by verbalizing coping statements (e.g., "I have to pay better attention") and progress statements (e.g., "I'm doing better). This is closely connected to teaching the autistic child to develop self-efficacy and self-regulation of their learning and social behaviour. By increasing the autistic child's self-efficacy and self-management ability, it will be one step closer to improving social interaction with others. Koegel and Koegel (1995) believed that it is important to train autistic children to be independent, as it has lifestyle implications for the individual child and family.

There is also a need to educate family members. Parents and siblings should support the child's changed behaviour after teaching interventions. The children need to practise skills at home, at school and in other social contexts. Parents should be told that the performance of individuals with autism often deteriorates when training contingencies are withdrawn (Coe et al., 1991). Continued support from parents is needed to encourage the child to "look" and "talk" to a level that it becomes "automatic". If research is not translated into practice in order to maximize its potential effectiveness, it will result no long-term improvement (Peterson and McConnell, 1993).

However, social skills is not a panacea. The ideal situation would be one in which such instruction is routinely provided at home and in both regular and special education (Sabornie & Beard, 1990).

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APPENDICES

Inter-observer reliability scores

Study 1

		Verbalization (no.)	Eye Contact (seconds)
Phase A	Session 5	Researcher: 5 Observer : 7	2 6
Phase B	Session 6	Researcher: 8 Observer : 10	16 19
Phase C	Session 13	Researcher: 11 Observer : 11	9 13
Phase D	Session 17	Researcher: 9 Observer : 7	11 10
Phase E	Session 21	Researcher: 9 Observer : 9	6 8
Return to A	Session 30	Researcher: 8 Observer : 7	6 6
1st Follow-up	Session 34	Researcher: 15 Observer : 17	4 7
2nd Follow-up	Session: 38	Researcher: 32 Observer : 36	8 9

Total number of verbalizations
Percentage of agreement

Researcher: 97
 $97 / 109 \times 100 = 88.9\%$

Observer: 109

Total seconds of eye contact
Percentage of agreement

Researcher: 62
 $62 / 78 \times 100 = 79.5\%$

Observer: 78

Inter-observer reliability scores

Study 2

		Verbalization (no.)	Eye Contact (seconds)
Phase A	Session 1	Researcher: 2 Observer : 1	3 2
Phase B	Session 6	Researcher: 9 Observer : 7	7 10
Phase C	Session 13	Researcher: 16 Observer : 12	6 8
Phase D	Session 18	Researcher: 13 Observer : 13	6 9
Return to A	Session 24	Researcher: 14 Observer : 12	4 8
Follow-up	Session 28	Researcher: 14 Observer : 11	2 2
Total number of verbalizations		Researcher: 68	Observer: 56
Percentage of agreement		$68 / 56 \times 100 = 121.4\%$, $100\% - 21.4\% = 78.6\%$	
Total seconds of eye contact		Researcher: 28	Observer: 39
Percentage of agreement		$28 / 39 \times 100 = 71.8\%$	

Inter-observer reliability scores

Study 3

		Verbalization (no.)	Eye Contact (seconds)
Phase A	Session 2	Researcher: 0	5
		Observer : 0	6
Phase B	Session 8	Researcher: 3	5
		Observer : 3	7
Phase C	Session 11	Researcher: 4	10
		Observer : 3	14
Return to A	Session 20	Researcher: 6	3
		Observer : 4	6
Follow-up	Session 23	Researcher: 7	6
		Observer : 6	8
Total number of verbalizations		Researcher: 20	Observer: 16
Percentage of agreement		20 / 16 x 100 = 125.0%, 100% -25.0%=75.0%	
Total seconds of eye contact		Researcher: 29	Observer: 41
Percentage of agreement		29 / 41 x 100 = 70.7%	

RAW DATA

Study 1

Phase	Session	No. of verbalizations	Total length of eye contact (seconds)
A	1	2	2
A	2	4	1
A	3	3	1
A	4	2	1
A	5	5	2
B	6	8	16
B	7	9	12
B	8	10	9
B	9	10	11
B	10	10	12
C	11	10	14
C	12	7	10
C	13	11	9
C	14	9	8
C	15	10	9
D	16	11	12
D	17	9	11
D	18	12	8
D	19	9	3
D	20	13	6
E	21	9	6
E	22	8	5
E	23	10	7
E	24	11	8
E	25	10	10
A	26	10	4
A	27	8	3
A	28	8	3
A	29	9	2
A	30	8	6
F(1st)	31	20	10
F	32	14	7
F	33	18	4
F	34	15	4
F	35	20	4
F(2nd)	36	15	4
F	37	20	10
F	38	32	8
F	39	15	1
F	40	19	3

RAW DATA

Study 2

Phase	Session	No. of verbalizations	Total length of eye contact (seconds)
A	1	2	3
A	2	2	5
A	3	4	3
A	4	3	2
A	5	1	3
B	6	9	7
B	7	1	10
B	8	8	4
B	9	7	7
B	10	12	3
C	11	12	4
C	12	16	7
C	13	16	6
C	14	11	3
C	15	17	6
D	16	13	2
D	17	9	3
D	18	13	6
D	19	11	2
D	20	9	3
A	21	11	4
A	22	14	5
A	23	12	3
A	24	14	4
A	25	15	3
F	26	19	2
F	27	11	3
F	28	14	2
F	29	14	2
F	30	15	3

RAW DATA

Study 3

Phase	Session	No. of verbalizations	Total length of eye contact (seconds)
A	1	0	5
A	2	0	5
A	3	0	1
A	4	0	1
A	5	4	1
B	6	4	10
B	7	2	8
B	8	3	5
B	9	3	7
B	10	9	5
C	11	4	10
C	12	1	8
C	13	5	6
C	14	3	8
C	15	8	5
A	16	5	5
A	17	2	9
A	18	7	4
A	19	3	8
A	20	6	3
F	21	3	9
F	22	5	6
F	23	7	6
F	24	6	8
F	25	6	6